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E. H. Embley Memorial Lecture.[1]

THE TEACHING OF ANÆSTHESIA, ESPECIALLY IN RELATION TO SAFETY AND RESUSCITATION.

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EMBLEY, in his first publication concerning anæsthesia which appeared in *The Intercolonial Medical Journal* in 1896, dealt with the question of anæsthetic teaching. Under the heading "The Question of Safety in Syme's Teaching in Chloroform Anæsthesia", he refuted the dictum of that great surgeon and his successors—namely, "Watch the breathing and let the pulse alone". From then onwards the bibliography of Embley's publications reflected in no uncertain manner his interest in the veracity of what was taught in anæsthesia and in the way it should be presented. He even went to the trouble of having printed a small monograph on the problems likely to be met by his students whom he taught very thoroughly during the time when he held the post of senior honorary anæsthetist at the Melbourne Hospital. The question of resuscitation during anæsthesia interested Embley greatly. His publications on the subject were in many ways in advance of the then current thought and teaching.

These above-mentioned aspects of Embley's interest in anæsthesia have tended, especially in latter years, to be completely overshadowed by his research work on chloroform, which he published in the *British Medical Journal* in 1902 under the title "The Causation of Death during the Administration of Chloroform". This is most unfortunate, because today many of his other publications on anæsthesia are of great value and have stood the test of time better than this above-mentioned widely known article on chloroform.

One learns by reading his publications that Embley fully realized not only that the safety and efficiency of the anæsthetic depend on the choice of agents and apparatus used, but that the anæsthetist must be fully conversant with the theory and practice of its administration.

It is instructive to note that Professor R. R. Macintosh, during his recent most appreciated visit to Melbourne, took no little pains to teach and demonstrate this precept—that is to say: "It is not what you use in anæsthesia so much as how you use it."

My experience in the capacity of Director of Anæsthesia at the Royal Melbourne Hospital since the department was inaugurated two years ago has given me many new ideas concerning the difficulties likely to be encountered by students learning how to use simple basic methods of anæsthesia, or by post-graduates when practising more advanced methods under supervision. Not only are many of these specific problems not to be found in either past or current text-books, but even if they are, the methods described to overcome them are in many cases a relic of the past, and if not just inefficient are in some cases positively a danger to the life of the patient.

Nobody is entitled to describe the average anæsthetic given today as a physiological process. It is at the least a temporary minor pathological process. Given inefficiently it can, of course, become a major pathological process, and in many cases is entirely responsible for the death of the patient.

[1] Read at a meeting of the Victorian Branch of the British Medical Association on April 4, 1951.

It is my opinion now, formed by observing the different methods of teaching used today, that undergraduates and post-graduates are shown and allowed to apply anæsthetic methods, whether simple or complicated, without full precautions to ensure that any anæsthetic emergency can be rapidly dealt with, and that the anæsthetic right from the commencement is being administered under conditions as safe as possible in the light of our present knowledge. One does not find this so in other spheres of life. For example, we all know the way in which millions of people today throughout the world use modern methods of public transport, particularly airlines, and these people accept a very slight but definite risk because it is taken for granted that every safety precaution is employed by the management and personnel operating such transport. Today, we still see many qualified medical practitioners submitting patients to anæsthetic risks that are always present whenever anæsthesia is employed, without having available adequate apparatus to give the anæsthetic or, what is more important, adequate means of dealing with any complications should they arise. Worse still, they employ anæsthetic methods without adequate training in the anatomical, physiological and pharmacological problems involved and with insufficient technical knowledge of the apparatus they employ. Lack of manual dexterity, which can be learned only by adequate experience under supervision, is another dangerous factor, and in some cases in which aptitude is lacking despite intense endeavour, it would be better for the sake of the public if such people refrained from giving anæsthetics. We must never forget that although science forms the basis of the anæsthetic its administration is an art and probably always will be.

I am convinced that the majority of anæsthetic deaths can be prevented, especially when one is dealing with patients who are relatively "good risks", because it all reverts back to adequate teaching and practical experience under supervision.

I should like to make the following suggestions.

Firstly, three simple rules should be strictly adhered to except under conditions of dire emergency in an outlying country district. These are (i) a means of rhythmically inflating the patient's lungs with oxygen to be available; (ii) a laryngoscope to be at hand and in full working order should it be necessary to inspect the air passages and if needs be to insert an endotracheal tube; (iii) suction apparatus in full working order to be at hand to suck out the patient's mouth and other air passages should vomiting occur or should there be threatened aspiration of any other foreign material such as blood. If the first two pieces of apparatus at least are not always on hand and in working order when one is commencing the administration of an anæsthetic, however simple—such as a short intravenous thiopentone administration or a simple "open" ether administration—then in the light of my personal observations I consider it malpractice.

Secondly, undergraduates and post-graduates should be trained to perform a simple safety drill before commencing the induction of anæsthesia. I teach our trainees before commencing to induce anæsthesia to check over the condition and preparation of the patient, the anæsthetic agents and the apparatus, because I am certain that in their subsequent career this procedure will become, as one might say, a reflex action and will ensure that any emergency arising even from the start of the anæsthetic can be dealt with adequately.

I evolved this idea after conversations with former and present members of the Royal Australian Air Force. If one obtains permission to peruse official training manuals for practical flying, one sees the emphasis placed on the value of following a certain drill, not only to ensure that no preliminary tests are omitted prior to "taking off" but also to see that they are carried out in a definite order, so that ultimately they become a reflex on the part of the trained pilot. When applying this system to pupil-anæsthetists one finds it difficult as a teacher to induce some pupils to appreciate the value of what is by him considered a needless formality. Unlike the pupil-pilot, the pupil-anæsthetist's life is not at stake and he does not appreciate the tremendous responsibility that an anæsthetist has, both morally and legally, towards his patient.

Thirdly, owing to the present large number of final-year medical students, the amount of time allotted to each student for full-time instruction in practical anæsthesia is in my opinion inadequate. Experience has shown me that at least twenty-four half-day sessions of actually giving simple anæsthetics are required for the average undergraduate to attain real efficiency.

Fourthly, with all due respect to our surgical colleagues here in Melbourne, I think that opportunities for training undergraduates in simple basic methods of anæsthesia at the teaching hospitals are becoming fewer and fewer owing to the surgeons' demanding unnecessarily on many occasions so-called special anæsthetics. If we are to train students properly, then there must be no curtailment of the use of ether given by the "open" method, except when the condition of the patient or the nature of the operation definitely excludes it.

Fifthly, a big step forward will be made in raising the standard of anæsthesia and hence in lowering the mortality rate if an occasional candidate at the final examination in practical surgery is submitted to a practical anæsthetic test. If the Faculty of Medicine established this right of submitting a candidate to a practical anæsthetic test, it would be not only in the public interest but also of tremendous value to the young recent graduate, who in no other branch of medicine takes on such early responsibility as when giving a simple anæsthetic. Even if the student is competent at the end of his course of instruction, too long a period elapses between his instruction and the final examinations to permit efficiency on graduation.

Sixthly, now that most of the general and special teaching hospitals in Melbourne have created departments of anæsthesia, it would be of great value during the training of resident anæsthetists to have a system of exchange between the various general hospitals and the Children's Hospital and the Women's Hospital, so that they receive post-graduate teaching in anæsthesia not only for general surgical work but also for pædiatrics and obstetrics. This would benefit in no uncertain measure the hospitals participating in this scheme, quite apart from the tremendous value it would have to the resident anæsthetists concerned, especially as the majority eventually become general practitioners.

To elaborate some of the above-mentioned factors which should influence the teaching of anæsthesia today, it would not be inappropriate to suggest the following routine for simple anæsthetics administered in teaching hospitals.

1. The history of each patient must be examined from an anæsthetic point of view and the operation slip inspected to see what drugs have been given pre-operatively.

2. Suction apparatus must be checked over and the oxygen supply turned on ready for instant use.

3. The anæsthetic machine allotted to cover the case from a resuscitation point of view must be tested as regards its ability to inflate the patient's lungs with oxygen, and the laryngoscope and endotracheal tubes must be inspected to see if they are in working order. This anæsthetic machine should follow the patient into the operating theatre, to be at hand should any emergency arise.

4. The anæsthetic room must have adequate light, either natural or artificial (preferably natural), for observance of the colour of the patient and to facilitate the administration of the intravenous injections *et cetera*.

5. A suitable ether mask adequately covered with fabric (layers of gauze) should be selected.

6. The ether and ethyl chloride containers to be used should be tested and identified.

7. An anatomically shaped airway of appropriate size should be selected and lubricated with an innocuous sterile catheter lubricant.

8. All the equipment should be close to hand so that the anæsthetist can reach it easily while sitting at the head of the patient without turning around (Figure 1).

9. There should always be a third person present in the anæsthetic room to give help when required, quite apart from the medico-legal aspects in the case of females.

10. The patient should be comfortably reclining on one pillow with the ears showing. The exposed ears act as a crude oximeter and are thus of great practical importance.

11. Prior to the intravenous injection of thiopentone, the patient's arm must be held properly by the assistant with his right hand acting as a tourniquet and his left hand in pronation grasping the patient's wrist. A rubber tourniquet should never be used, nor should the patient's garment be twisted to act as one, because these methods are not only inefficient but also painful to the patient.

12. The needle must be inserted in the direction of the long axis of the vein and at an angle as parallel as possible with the patient's skin. The skin should be retracted at

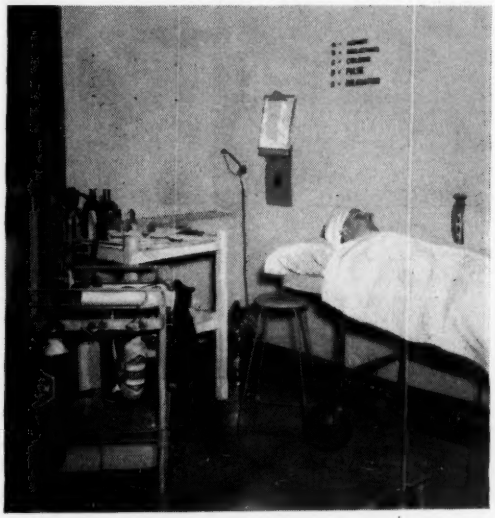

FIGURE I.

a point more distal where the needle is being inserted, so that the vein is fixed or locked—that is to say, it is immobilized by the tension of the overlying skin (Figure II).

13. In order to ensure that the patient is "dry" throughout an ether anæsthetic, give every adult patient one one-hundredth grain of atropine intravenously, even if he has had an injection of atropine in the ward. If he has had no atropine in the ward he should be given one-seventy-fifth of a grain of atropine intravenously or even one-fiftieth of a grain if his size warrants it.

14. During the intravenous injection the syringe should lie parallel along the patient's skin, and in this position the point of the needle should be gently elevated to act as a definite guide as to whether the injection is truly intravenous. The aspiration test is not accurate. Because blood has been aspirated back into the syringe, it is no definite proof that the succeeding injection will deposit the solution wholly inside the vein. It is only by meticulously observing the point of the needle throughout the whole of the injection that one can guarantee that the solution has been completely injected intravenously.

15. Once the needle is in the vein and the injection has been commenced the hand of the assistant acting as the tourniquet should be gently relaxed from the patient's arm without dragging the skin and thus displacing the needle from the vein. The said hand should then be gently placed under the patient's elbow to prevent the arm from sagging once the injection starts to take effect (Figure III).

16. Great care must be taken in selecting the vein for the intravenous injection of thiopentone to ensure that it is definitely identified as a vein and proved not to be a variation of the arterial supply to the limb. Just as dangerous as the injection of thiopentone into an artery in mistake for a vein is the injection into a vein in close proximity to an artery. The magnitude of the tragedy that may be precipitated by the intraarterial injection of thiopentone cannot be over-emphasized. Many arms have had to be amputated as the result of gangrene following such an injection. Should this misplaced injection occur, the situation can be retrieved by a prompt intraarterial

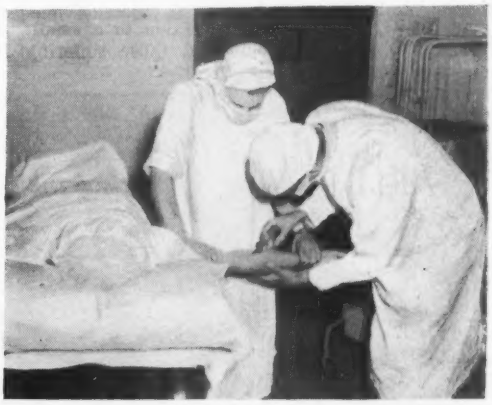

FIGURE II.

injection of procaine through the undisplaced needle, and should this prove ineffective a brachial plexus block has proved an effective counter on several occasions. Contrary to the advice of some authorities, who state that the arterial spasm will wear off in time without treatment when other than very strong concentrations of thiopentone are used, this hypothesis is too risky in view of the enormity

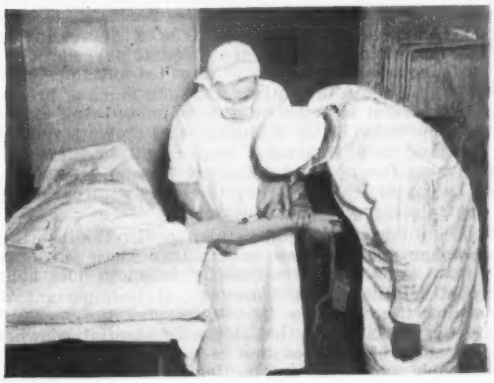

FIGURE III.

of the disaster should it occur. Active treatment on the lines mentioned above should be promptly effected in every case of arterial spasm following intraarterial injections of thiopentone. For extravenous injections of thiopentone, especially with solutions stronger than 2·5%, prophylactic treatment should be instituted after the operation to avoid sore and even grossly inflamed arms. The action of moist heat applied for forty-eight hours—for example, in the form of an "Antiphlogistine" or "Plastine" poultice—will avoid this complication. It is most impor-

tant from a medico-legal point of view to keep a fully signed and dated record of the prophylactic treatment instituted for these above-mentioned dangerous complications.

17. A vein selected on the dorsum of the hand, except on the extreme radial side, is immune from any of the above-mentioned risks of intraarterial injection. (Professor S. Sunderland, personal communication.) Hence, whenever possible use veins on the dorsum of the hand (Figure IV).

18. The amount of thiopentone to be injected must be just sufficient to render the patient unconscious. Needless to say, there is no rule of thumb as regards the dosage of thiopentone. Every patient reacts differently to the drug owing to such factors as age, physique, weight, temperament, health *et cetera*. The injection must thus be made slowly and the early reaction to a small "test" dosage noted. In old people and those suffering from

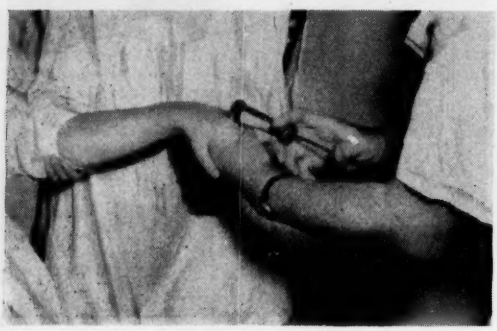

FIGURE IV.

cardio-vascular disease, a delayed reaction may occur owing to increased circulating time. Thus a longer pause must be made after the initial "test" injection in order to gauge the patient's reaction to the drug. Should an overdose be given owing to the neglect of these basic rules, then the patient's lungs must be immediately rhythmically inflated with oxygen by means of the anæsthetic machine at hand, the airway at the same time being checked. It is well to remember that the immediate treatment of a patient suffering from a gross overdosage of a depressing drug such as thiopentone is to ensure adequate oxygenation, and not the intravenous injection of so-called antidotes such as picrotoxin. Should the patient not show signs of breathing after the careful injection of thiopentone, owing either to central depression or to a blocked airway from relaxation of the jaw, then this must be promptly dealt with by manœuvring the jaw and even inserting an airway and if needs be rhythmically inflating the lungs with oxygen until the central depression has worn off.

19. Edentulous patients generally require the insertion of an oro-pharyngeal airway sooner than those with teeth. Care must be taken to see that the facecloth does not slip and obstruct the patient's airway. It is important when examining the patient's face to remove the mask first, before the facecloth, so that it can be ascertained whether the facecloth has slipped and is causing this obstruction. This simple manœuvre can be the means of identifying on many occasions an otherwise baffling obstruction simply caused by the facecloth slipping over the airway (Figure V).

20. At any time during the administration of the anæsthetic, both in the anæsthetic room and in the operating theatre, should the patient's anæsthesia become light enough for him to refuse the irritant ether, a small amount of ethyl chloride may be administered in order to deepen the anæsthesia to a stage at which he will again accept the irritant ether. This procedure, although contrary to text-book teaching, is of great importance from a practical point of view.

21. Should the condition of the patient at any time give rise to anxiety, the administration of the anæsthetic must cease, the mask and the facepiece be withdrawn in that order (see above), the airway checked and oxygen administered to the patient by means of the facepiece connected to the anæsthetic machine, and the supervisor's help requested. Calamities in anæsthesia occur very swiftly, and often little time is left to reverse a condition which will soon lead to death if not properly diagnosed and treated.

22. It is the anæsthetist's duty to see that the patient's head is not placed too near the end of the trolley or operating table. Once the patient is arranged on the operating table it is difficult to correct any faulty position, and thus the anæsthetist will have to work under adverse conditions both for himself and for the patient. It should be remembered that hyperextension of the head as a rule does not improve the airway, and the normal recumbent

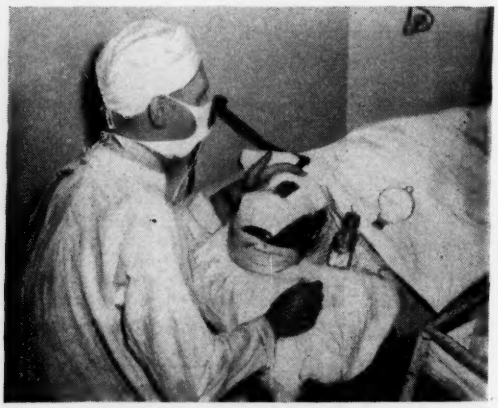

FIGURE V.

position requires a moderately sized pillow under the patient's head.

23. The maintenance of a clear airway is the primary duty of all anæsthetists for all anæsthetics, and in the case of a simple "open" ether administration it is usually maintained by the anæsthetist's supporting the patient's jaw in such a manner as to free the base of the tongue from the back of the throat. For this procedure to be wholly efficient, especially in edentulous patients, it is necessary to use an oro-pharyngeal airway. In the care of certain patients, especially those with underslung jaws, it may be necessary for the anæsthetist to use both his hands to hold the jaw forward efficiently. Under these circumstances the assistant—who should always be in the room, as previously mentioned—may drop on the ether under the anæsthetist's direction (Figure VI). Should this special manœuvre fail to maintain the airway, and should a vicious circle of sub-oxygenation with jaw clenching occur in a patient who has his own teeth, this may be relieved by a very simple device—namely, the use of a naso-pharyngeal airway. In such situations created by this vicious circle of sub-oxygenation with jaw clenching, the careful insertion (without causing epistaxis) of a very soft rubber naso-pharyngeal tube will maintain an airway past the obstructing tongue until the relief of sub-oxygenation and greater depth of anæsthesia permit the mouth to be gently opened and the more efficient oral airway inserted. In accordance with a suggestion by a colleague (Dr. A. L. Bridges Webb), we have a selection of special soft rubber naso-pharyngeal airways always on hand. Contrary to former teaching, no attempt should be made to force the clenched teeth open with gags or wedges. These should be abolished and relegated to museums.

24. The patient's eyes must be protected from abrasion by care in seeing that the lids are kept closed underneath the facepiece and that sterile paraffin oil is instilled into each eye. Contrary to text-book teaching, an "anæsthetic

eye" is nearly always due to corneal abrasion, and the eyes must be kept closed and well oiled throughout the anæsthetic. Eye signs are rarely used today except as regards eye movements preceding the attainment of the second plane. The corneal test is a thing of the past.

25. The pupil-anæsthetist should not be misled by the so-called automatic breathing which patients often apparently exhibit, even though their anæsthesia is quite light and they are not anæsthetized from a surgical point of view. The fact is that the injection of thiopentone upsets to a large degree the classical breathing signs often taught —unfortunately in a very dogmatic manner.

26. If the patient shows signs of starting to vomit during the induction, he must be quickly placed on his side in the so-called tonsil position and the vomitus sucked away

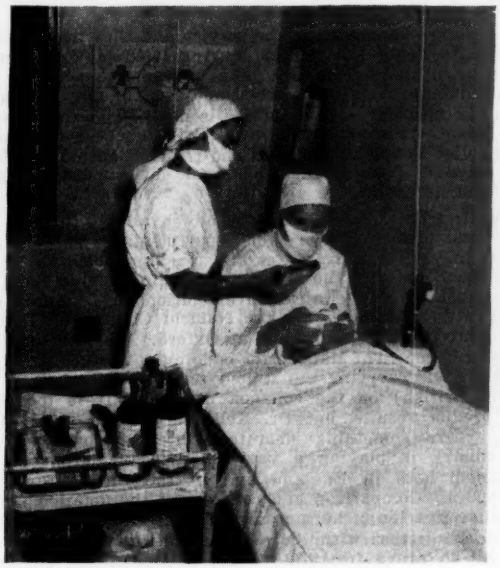

FIGURE VI.

(Figure VII). Only after careful examination of the air passages to see that they are free of vomitus must the anæsthetic administration be recommenced. Vomitus during the induction is generally caused by the procedure's being "swinging" instead of a steady deepening—which, of course, is the hallmark of a skilled anæsthetist compared with the novice. If the patient shows signs of commencing to vomit in the operating theatre, this is usually due to his anæsthesia being allowed to become too light, and unless the anæsthesia is rapidly deepened vomiting will commence. If this occurs the anæsthetic must be quickly withdrawn, the patient's head turned to the side, the surgeon asked to stop operating and the patient lowered as much into the Trendelenburg position as is thought desirable. The oral sucker (metal) must be immediately used to clear the airway, and if needs be the assistance of a trained anæsthetist obtained to perform tracheal suction via a laryngoscope or bronchoscope.

27. When ether is given by the "open" method, it is much better to keep the patient at a good depth of anæsthesia (second to third plane) so that the relaxation is good and the surgeon can perform the operation with ease. It is better to forget the theoretical disadvantages of deep ether anæsthesia, such as its histotoxic effect, and concentrate on giving a good, deep anæsthetic to the benefit of the patient's welfare and the satisfaction of the surgeon. Theory carried to extremes in anæsthesia, to the detriment of practical common sense, will not only harm the patient but hinder the surgeon's work.

28. During the maintenance of an "open" ether anæsthetic, it is most desirable to run a small trickle of oxygen continuously underneath the mask by means of a soft rubber catheter, which should never be inserted in the airway. It has been known empirically for a long time that patients do better with a slight trickle of oxygen, and recently scientific quantitative methods have confirmed this observation.

29. At the completion of the operation and the cessation of the administration of the anæsthetic, the patient's airway should be checked over and further oil placed in his eyes before he is handed over to the care of the person taking the patient back to the ward. Any excess mucus in the patient's upper respiratory passages should be sucked out by means of the metal sucker always at hand before the

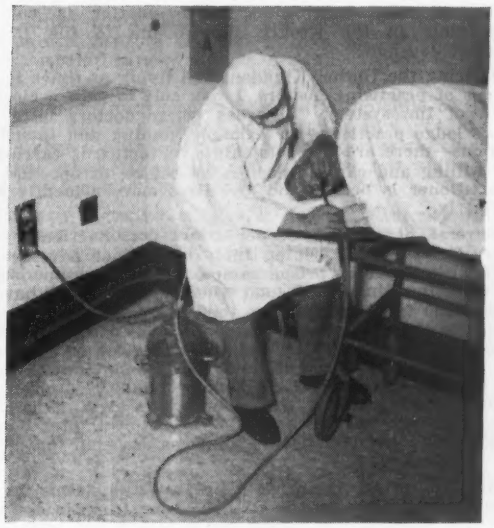

FIGURE VII.

patient leaves the operating theatre. Great care must be exercised in placing this instrument in the mouth, because, although it appears to be smooth and round in shape, it can cause great trauma if used in a clumsy fashion. It is better to introduce it alongside a finger in the mouth which acts as a guide, but a finger should not be used when the patient's anæsthesia is light enough for him to bite.

As was previously mentioned, practical anæsthesia is a dynamic art, and there is no time for contemplation and slowness of movement. The student, to develop manual dexterity which is so important to the success of an anæsthetic, must make all his movements quickly and without hesitation. For example, when it is considered that it is necessary to insert an oro-pharyngeal airway, the mask and then the facecloth must be quickly removed and the airway inserted with all speed, so that no more than three breaths of air are obtained by the patient, otherwise the anæsthesia will be so rapidly lightened that he will not tolerate the airway which has just been inserted.

Conclusion.

In conclusion I should like again to emphasize the theme that should dominate anæsthetic teaching—namely, that it is not so much the drugs and apparatus used but how they are used that counts for safety and efficiency.

Acknowledgement.

I wish to thank the Trustees of the E. H. Embley Memorial Lecture for the great honour they have accorded me in appointing me to deliver the seventh lecture.

SURGERY AND SURGICAL TEACHING OVERSEAS.[1]

By A. E. COATES,
Melbourne.

THE purpose of my visit overseas was to study the latest developments in the undergraduate teaching of surgery, and also recent advances in that changing specialty, general surgery.

General Impressions in the United Kingdom.

The National Medical Service is being implemented by doctors as well as could be expected. Dr. Grey Turner, of British Medical Association House, gave me an outline of the British Medical Association's general approach, their difficulties and their aims. This matter is covered adequately in the weekly supplements to the *British Medical Journal.*

Touring the United Kingdom and living at times in the homes of practising doctors, I was able to gain a close-up view of the system. In areas where doctors have had large lodge practices—for example, mining and industrial regions—there are few complaints. Practice is carried on by willing and capable doctors as before, except that the practitioner is better paid and lives more affluently than formerly.

Several of my ex-prisoner-of-war doctor friends, who were accustomed to doing their best under adverse conditions in Japanese prison camps, and who became skilled in detecting illness in a man when they saw him, have no objections to being paid for their work. They go out at night to their patients, if called, without demur. Perhaps their main complaint is that the treatment of their very ill patients passes out of their hands and that they have to refer so much to the regional hospitals. However, this anomaly is recognized by the authorities at Whitehall, and attempts are being made to have local practitioners attached to the regional hospitals as associate physicians or surgeons.

In the residential areas there are complaints by the doctors that they cannot give the time to their erstwhile private patients, who expect the old-fashioned social visit and personal attention while remaining "service" patients. Some of the practitioners in better-class residential areas retain their patients on private fees; that is, the patients prefer to have their private doctor outside the medical scheme. Some of my friends of the "retired army officer" class told me that they preferred to pay and please themselves in the selection of their doctor and the amount of time he gave them.

Doctors on the staffs of teaching hospitals were paid for their attendances, and their private practices did not seem to be seriously impaired. In fact, in one large city a surgeon who spends four sessions a week at his hospital (a large teaching institution) has interests in three private hospitals, where he frequently operates. His only fear is that the present conditions may not continue.

Sir John Stopford, Sir Harry Platt, Sir Geoffrey Jefferson, and Sir John Morley entertained me at lunch on my arrival in Manchester, and they discussed the National Medical Scheme for my benefit. They all agreed that, despite its faults, it had provided surgical care of a high order in industrial areas, where such care was not formerly available, and that the allegations of extravagance in wigs, false teeth, spectacles, wooden legs *et cetera* were not fully justified. These amenities were well deserved by poor people, who had stood the "blitz" of England in the recent war. The people of England had put up with a lot, and any amelioration of their conditions was reasonable and not a matter for criticism by Australians who live in a land of plenty. I could not help thinking as I roamed about England that a good rump steak would be better than a bottle of mixed vitamin pills on the "free medicine" list for many of the people I saw. Despite food shortage, individual hospitality was free and generous. Both the Royal College of Surgeons and the Nuffield Foundation Trustees provided official hospitality. The English, Scottish and Irish are our kinsmen, and it seemed to me that it was not my function to criticize their methods of obtaining some comfort in these troublous times. It might become us better if we in Australia and our cousins in America sent over a few shiploads of meat. However, this is out of my depth.

I discussed the National Medical Service with Sir Ernest Rock Carling of the Home Office, and he is fully aware of the defects in the scheme. The general practitioner service is in danger of degenerating into a certifying service, the doctor being a glorified clerk, whose reputation may depend on his skill not as a healer, but as a generous signer of certificates, prescriptions *et cetera.* Group practice was helping to correct some of the faults and make life more tolerable for doctors.

There are anomalies in the service and they need correction. No doubt the British, having tried an experiment, will learn its defects and take appropriate action. We have different conditions, social and economic, in Australia, and the need for such a service is not so apparent. None the less, there are elements in the British service, especially as applied to teaching schools and regional hospitals, which we might well study and adopt with such modifications as we find necessary.

Apart from the help which is now available through the National Medical Service for departments of surgery and medicine in the universities and teaching hospitals, much has been done by the Nuffield Trust to provide facilities for research and clinical investigation in hospitals and institutes. Examples are the Nuffield Chairs and Department at Radcliffe Infirmary at Oxford. The Rheumatism Research centre at Manchester is doing good work. Dr. J. H. Kellgren is carrying out a long-term investigation (typically British) on the collagen diseases. It is too early to predict results, but Dr. Kellgren assured me that in ten years something definite will be known. Histochemistry is playing a part in the elucidation of the problem both in England and in the United States of America. Comparison and contrast of the detailed results of investigation of hormonal disorders presenting bone and joint syndromes with those of the rheumatic diseases are likely to prove fruitful. ACTH and cortisone are being tested scientifically, and it is probable that a new conception of the rheumatic disorders will be worked out.

Not only is the National Orthopædic Institute in London under Mr. Hugh Seddon providing a good post-graduate training for surgeons, but also some careful research is being carried on. Radiomicrography is proving a useful adjunct to the usual clinical and biochemical methods. Dr. Sissons, a Melbourne graduate, is doing good work there. It is interesting to note that patients, private and public, who attend the institute are submitted to a thorough medical and neurological examination before coming under the care of the orthopædist. Consultations are frequent and peripheral vascular disorders are not overlooked.

A visit to the weekly seminar at the Brompton Chest Hospital is refreshing to a general surgeon. Mr. Price Thomas impresses one as a good doctor, as well as a renowned thoracic surgeon.

The London teaching hospitals call for no comment. There one may see leaders in surgical diagnosis and technique performing their favourite operation as well as or better than most.

Special mention should be made of Brock's advances in the surgery of the heart. On both sides of the Atlantic great developments in vascular surgery are in train. Michael Boyd of Manchester is a leading angiologist. His work is mainly on the peripheral circulation, arterial and venous. Sympathectomy is an operation to be seen performed in any large hospital any time. Hypertension, *angina pectoris* and arterial disease of the extremities are treated by sympathectomy. Although one London surgeon told me sympathectomy for hypertension was on the way

[1] Read at a meeting of the Victorian Branch of the British Medical Association on May 2, 1951.

out, I saw many surgeons performing the operation and claiming to produce relief of symptoms, and even the abolition of the retinal exudates.

Boyd's clinic is one of the best in England. Dr. A. Hall Radcliffe, a scientist of Oxford, a member of the Department of Surgery, carries out the necessary physical investigations by means of electrical and other apparatus. Arteriography and phlebography are regularly performed in this as well as in many other clinics. Manchester has a fine body of teachers and investigators in the medical school. Sir Geoffrey Jefferson is the doyen of neurosurgeons, and is spoken of with admiration and affection in the United States of America.

Sir James Learmonth's work on vascular surgery needs no comment. His clinic is a cross between the regular Scottish clinics and the high-pressure investigational departments of the United States medical schools. Operations for portal hypertension are still performed by Professor Learmonth, but he has not such a high opinion of its efficiency as some surgeons in the United States of America. I saw him perform lieno-renal anastomosis. He is investigating arterio-venous abnormalities in the upper part of the abdomen.

Vascular surgery is well advanced in New York (Glenn, Blakemore), Baltimore (Blalock), Yale, Boston and Toronto, and at the Mayo Clinic. Coarctation operations and operations for patent *ductus arteriosus* are daily to be seen in the large hospitals. Continuous fine thread suture is used more and more. Aortic grafts are being performed in New York. An "aortic bank" is available at Cornell (New York) Hospital. A segment of aorta, the right length and diameter, can be produced, sterilized on a plate (of nutrient broth) on demand. Bone banks, corneal banks, aortic banks take the savings of a lifetime. I saw some of the aortic grafts some weeks old, and in a good state of preservation. One human patient had been successfully treated with an aortic graft. Animal experiments had shown that the graft did not distend, and that there is an invasion of the graft by the normal layers of the aorta. Segments of femoral or saphenous vein are used to replace damaged portions of arteries such as the popliteal.

Dr. A. H. Blakemore showed me a patient with a large saccular aortic aneurysm of luetic origin, treated with coils of fine wire through which an electric current is passed, so that coagulation is produced in the aneurysm. A rubber band was then tied around the aneurysm and kept sufficiently tight by silk sutures. He also showed me a patient who a few days before had had a complete thrombosis of the bifurcation of the abdominal aorta. Incipient gangrene of both legs was imminent. Both femoral arteries were opened in the groin, the clot was extracted and washed out with saline and heparin. A tiny plastic tube (polythene) was placed in one femoral artery, neatly sutured and connected to a "drip" of heparin. Dr. Blakemore also demonstrated two cases of severed common bile duct (one sees many more such cases in the United States of America than in Australia). Jaundice and liver failure were present. Cirrhosis of the liver was severe. Blakemore is not certain whether porto-caval shunt should be performed, or a biliary fistula created, or both.

I saw Dr. George Humphries of Columbia perform Brock's operation for pulmonary stenosis.

At Yale much experimental work is being done by Dr. Glenn, a general surgeon interested in the vascular system. The "heart" pump is being used on dogs. This artificial heart of various shapes and sizes was to be seen among other places at Philadelphia, Yale and Minneapolis. Much ingenuity is shown in the perfection of this apparatus, which allows the cutting off of the circulation from and to the heart and the performance of intracardiac surgery. To date it has been successfully used on dogs, the heart being empty for half an hour. Some clinics have lists of patients in order of priority for intracardiac operation as soon as the machine is perfected. One big drawback is the coronary blood flow, 1000 millilitres per minute. For an operation lasting ten minutes, 10 litres of blood would somehow have to be put through the coronary circulation.

Brock's operation for stenosis of the mitral valve—dilatation with the finger through the auricular appendage—is regarded as the best yet. His knife may be used.

Young surgeons and scientists in the United States of America are intent on perfecting the artificial heart, and he would be a bold man who said that it cannot be done.

One clinical research project had its amusing side. In a hot room at Yale, patients undressed were sitting sweating, the sweat being collected for quantitative and qualitative analysis.

A visit to Blalock's department at the Johns Hopkins Hospital was memorable. The simplicity of the buildings and equipment was striking. It is the men that count. Blalock's contribution to the surgery of Fallot's tetralogy and allied conditions needs no description. I had the pleasure of hearing Dr. Blalock give an address on heart and vascular surgery at Dr. Owen Wangensteen's anniversary dinner at Minneapolis.

Modern neurosurgery in America is the child of Harvey Cushing, and the library named after him at Yale and containing his own books is a reminder of the influence of that man. His pupils are scattered across the world and lead today in that branch of surgery.

Perhaps the most wonderful neurosurgical operation I witnessed was that of Sir Geoffrey Jefferson. He removed a tumour from the third ventricle via the *corpus callosum*. Routine operations in his clinic (the best in England) are the sections of sensory nerves of the head and neck for cancer of the mouth and face. The pain following irradiation in these cases is insupportable, and rhizotomy by the posterior fossa route is preferred to leucotomy and other cortical procedures.

Earl Walker of Johns Hopkins Hospital favours nerve section. He does not favour leucotomy or topectomy because of the character change. With modern anæsthesia and proper positioning of the patient, it is possible to divide all the necessary posterior roots whether cranial or spinal. Walker told me that he had returned more and more to rhizotomy. I observed the results of leucotomy for intractable pain, some at "death meetings". Its value in mental cases is not so great as that of topectomy, according to Poole of New York.

Investigation of epilepsy of cerebellar origin is being carried out by Earl Walker and his staff. Elaborate electronic equipment is used. Electroencephalography is a major activity.

Dr. W. Penfield, of Montreal Neurological Institute, is performing a series of experiments, laboratory and clinical, on temporal lobe epilepsy.

Fewer gliomata were being treated by radical surgery that when I was last abroad. Methods of diagnosis have improved. Dr. George Moore of Minneapolis demonstrated his method of intravenous injection of radioactive fluorescein and the localization of the brain tumour by electronic devices such as the Geiger counter; I also saw his method of delineating the growth which fluoresces under ultraviolet light. Moore received the quinquennial Grosse prize for this work.

Electronics have a future in diagnosis, and radioactive isotopes appear to offer some prospects in therapy.

The close collaboration of physicists, chemists and clinicians is a pronounced feature of the American departments of medicine and surgery.

Vagotomy for duodenal ulcer is not so popular now. Dragstedt always performs gastro-enterostomy as well as vagotomy. It appears to have a place as an ancillary procedure. Wangensteen combines antrectomy and pylorotomy with vagotomy in the treatment of duodenal ulcer.

Professor F. H. Bentley of Newcastle is doing some interesting experimental work on vascular shunts in the stomach in patients suffering from peptic ulcer. There is

more in shunts than meets the eye, and it may well be that new methods of investigation such as radiomicrography will reveal more details of this interesting phenomenon.

Intravenous feeding is being developed to a fantastic degree, especially in Boston. Francis Moore has a large range of materials for intravenous use. In addition to a variety of sugar and salt solutions, amino acids, fats and alcohol are given by the veins.

In cancer therapy the Holt Institute at Manchester provides good collaboration between radiotherapists and surgeons. In London, as also at the Memorial Hospital, New York, there is a swing away from radium for cancer of the cervix, lip, tongue and oral cavity, and a return to surgery. Dr. A. O. Whipple, Director of the Memorial Hospital, New York, stated that radiotherapy had led to too many complications, fistulæ *et cetera*, and that the only group of diseases for which radiotherapy was prescribed at the Memorial Hospital consisted of lymphomata, Hodgkin's disease and the like.

The Ritchie Russell method of percussion of painful neuromata in amputation stumps was being widely used and reports were favourable. Extensive burns treated with ACTH at Belle Vue Hospital, New York, provided evidence of a new field of clinical research. A Negro patient, so severely burnt that both ears were missing, and the chest, arms, abdomen, and legs involved, was seen on the seventh day sitting in a chair. No infusion or other intravenous therapy had been used. There was obvious healing rapidly progressing under a firm pellicle, and no pus was seen.

A refreshing half-day was spent with Professor Sir James Spence. His "new medicine" for babies, mother and baby being accommodated in a small room in converted houses near the Newcastle Infirmary, gave practical evidence of his scorn for the modern "factory" type of hospital, with its main entrance and a large section of its space devoted to administration.

Of patients treated by surgery for ulcerative colitis, more than 50% had a permanent ileostomy. Ileo-anal anastomosis has been abandoned by Wangensteen and other leaders in this field.

In many American clinics thoracic surgery is part of general surgery. There is less ultraspecialization than formerly in the United States of America. British surgeons have never departed from the traditions of the good general surgeon.

Surgical Teaching.

At a post-graduate level the Royal colleges are doing a great deal to prepare candidates for the fellowships and diplomas. Sir Gordon Gordon-Taylor devotes part of every Wednesday to interviewing overseas students and giving valuable advice. There is a feeling expressed by Sir Hugh Cairns, Sir James Learmonth and Mr. Farrar Brown, secretary of the Nuffield Foundation, that overseas graduates, holding local senior degrees and diplomas, spend too much time sitting for further examinations in England and then depart for their own country without having made valuable contacts or done valuable work under leaders in medicine or surgery. The graduate armed with his new diploma is too old and too tired as a result of repetitive examinations to devote time to research work, in which he might find good training and a life interest. He has not derived the maximum benefit from his visit abroad. While one admits that only a small proportion of graduates are going to do successful research, and that it is not wise to spend a lot of money on dabblers, there is a reason for the training of serious graduates in investigational work. Many of the great men of medicine and surgery of the last fifty years have had a period in the laboratory or in the academic atmosphere under the influence of the scientific worker. They return to their clinical work not as mere craftsmen. However, the training for a fellowship or membership in England is probably better than anything to be obtained in Australia and is desirable for the average man. Suggestions were made to me that an exchange system between English and Australian graduates should be established. I consider this desirable and practicable in research institutes associated with our teaching hospitals, as also in university departments. Until we have properly functioning departments of medicine and surgery under professorial direction I am afraid that such exchanges could be only occasional and on a personal basis in the clinical field. English recognition of Australian higher qualifications would be a necessary prerequisite for large-scale exchanges. There are other good reasons, apart from medical training, for the interchange of young doctors in various parts of the British Commonwealth. For cultural reasons every young Australian doctor should try to visit England. In the United States of America and Canada the resident system of training surgeons provides for this scientific and clinical apprenticeship. Of this, more anon.

It is interesting to contrast the methods of teaching undergraduates in the English-speaking countries. As we pass from Melbourne to England and across the United States we encounter a definite progression in the scientific approach to clinical problems and a closer and closer link of clinical work with the laboratory and research room. In other words, in Melbourne clinical schools there is a half-hearted attempt to squeeze into the curriculum a little clinical research teaching, and an outmoded system of remote university control by the Faculty of Medicine through Stewart lecturers and more recently through the Coordinating Committee of Clinical Studies. After graduation a doctor, having completed his medical education, may elect to study for higher qualifications, and some provision is made for a few lectures, and perhaps a short apprenticeship of a year will be undertaken in a surgical or medical specialty. He may acquire a higher degree without having much practical experience in his specialty. By contrast, in the mid-west of America, undergraduate and post-graduate work is continuous. The doctor is a perpetual student. The resident system in operation in most of the best United States of America medical schools provides for a thorough training of the specialist for five years after graduation. Selected graduates from the first-year interns may be attached to a professor of surgery, and under his direction they will spend five years in the teaching hospital as residents. In early years they assist at operations, take histories and attend to the patients under direction. In later years of training they operate alone and conduct rounds for undergraduates. During training a young surgical resident will be attached for periods of six months or more to general surgeons, orthopædists, neurosurgeons and gynæcologists or urologists. Six months are spent in research work, animal operating, or pursuing a line of investigation in which he is particularly interested. Some months are also spent in the pathology department. At the end of five years the trained resident may sit for his American Board Examination. Not only clinical and operative competency, but also preclinical knowledge is tested. This system obtains throughout the United States of America and ensures a thorough practical and theoretical training in surgery.

In order to provide the material for these residents to investigate and operate upon, the department of surgery, under its professor, usually controls all the non-paying beds in the teaching hospitals. The patients in these beds are the field of operation for the resident staff under professorial direction. Visiting staff—that is, selected doctors who are interested in teaching—perform duties as teachers to undergraduates, but they operate only on their private patients, whom they send into the private or intermediate beds in the teaching hospital. Residents may assist such surgeons at private operations and carry out necessary after-care on the spot. This system has many obvious advantages for the surgeons concerned, both junior and senior. The professor of surgery has at hand a staff of younger men in various stages of training, who help him with his teaching and gain experience in association not only with him, but also with the visiting staff of the hospital. The latter are men who have gone through the same training themselves and understand the position well. Obvious disadvantages are that once a man has completed his training he may go into practice in the town and attend as a visiting surgeon, but it may be years

before he builds up a practice which provides him with even a portion of the work he was accustomed to do as a fifth-year resident. Whether the indigent patient receives as good a surgical deal as in Australian teaching hospitals is debatable.

The Toronto school overcomes this difficulty to some extent. The post-graduate training lasts for four years, and opportunities are offered in the various teaching hospitals associated with the university. Geographically Toronto resembles Melbourne. There are a number of teaching hospitals under the university and there is some rotation of students. Surgery may be done in one hospital, medicine in another. This holds also for Boston. The professor in a department of surgery in the United States of America and in Canada is in many cases a full-time teacher. He works only in one hospital (though visiting others weekly perhaps for staff rounds), he receives a university salary, but is allowed some private practice in the teaching hospital. This is the Harvard system, and it appears to work very well. The emphasis is placed on teaching and research, and the professor is not expected to compete in a big way with his colleagues in private practice. Nevertheless, he is expected in many places to earn some of his income by his own work and thus keep himself from degenerating into an academician or obscurantist.

In Chicago, at Northwestern University, the professor and staff earn almost all their income by their own private practice, but that practice is carried out in a hospital across the road. At the Medical Clinic of Chicago, on the other hand, all the professorial staff in the clinical units are receiving straight salaries, which, however, are usually double those of preclinical or other non-medical staff.

In England, professorial units have been started in most of the London hospitals and in some of the provincial teaching hospitals. Such units—for example, that at Saint Bartholomew's Hospital—are similar to other "firms" in the hospital, except that the head, the professor, is a salaried officer of the university, who organizes the teaching, carries an additional load, and receives much less income than his privately practising colleagues in other "firms". This anomaly may be corrected to some extent by the proposed special awards. I was impressed with the work done by Sir James Patterson Ross, of Saint Bartholomew's Hospital, and by Professor Michael Boyd, of Manchester, who, despite difficulties, have enhanced the reputation of their schools and contributed to knowledge.

In some London schools the choice of professor had not been fortunate and criticism of the method would consequently be unfair. In Scotland the system of having salaried professors of surgery has been successful, notably at Edinburgh, Glasgow and Aberdeen.

Sir James Learmonth at Edinburgh has no restriction on his practice, but he devotes practically all his time to his university department of surgery. He has gathered around him a band of able young men, and his "Americanization" of the Scottish school has been successful.

Smaller schools, such as that in Cardiff, have developed the full-time system of professors for some years. Professor Lambert Rogers, born in Victoria, is in charge of the department of surgery at Cardiff.

London surgeons of the older school are critical of full-time chairs and departments of surgery. Such criticism should be carefully considered. But even the most severe critics admit that some of the full-time chairs have been very successful. The contribution to knowledge which is a function of a university must go hand in hand with the orthodox teaching of the rising generation. The young undergraduates should be brought up in an atmosphere of inquiry and should not accept as final and for all time the opinion of text-book or clinician.

In the past the London medical schools, under the remote control of the University of London, have been great centres of orthodoxy, but it is doubtful whether they all are as preeminent today in the field of new discovery as Manchester or Edinburgh.

An interesting experiment at Guy's Hospital is the appointment of a part-time director of surgery; Mr. Hedley Atkins is a happy choice and is doing much to improve teaching methods. The exhibition is a feature in this school—a frequently changed series of illustrations and museum specimens of regional disease and its surgical treatment. Television has also been tried, but it appears to be more suitable for congresses than for routine undergraduate teaching.

Comment.

The glory of London teaching appears to be the good basic training in anatomy, physiology and pathology, and a sound theoretical grounding in surgery. This is the method which in the past we have adopted in Melbourne, partly because our early teachers came from Great Britain, and partly because of our predilections in favour of things British.

It is time that we took stock of our system of undergraduate education, to say nothing of improving opportunities for post-graduate training and research. We must be careful not to discard what is good, that which has stood the test of time, and that which has made our medical school well known as a school for good doctors. We must not throw out the baby with the bathwater. On the other hand, a judicious appraisal of newer methods, not because they are new but because they are fruitful and productive, and a careful adoption of those improvements which most readily fit into our present system, would do much to correct the impression abroad that the Melbourne school of surgery is resting on its past good name.

For this reason I strongly advocate the development of chairs in medicine and surgery under university direction in our teaching hospitals. If we as an enthusiastic body of medical men lend them whole-hearted support, if we encourage younger men in teaching and research, and see to it that they are not embarrassed financially because of their dual endowments of intelligence and lofty motive, then will the Melbourne medical school deserve comparison with Boston, Toronto, Edinburgh and Manchester. Then will the reputation of the Melbourne medical school be justified in all respects, equally in research and investigation as in the quieter but none the less important field of orthodox teaching.

Time does not permit of further discussion of the details of undergraduate teaching in England, Canada and the United States of America. Some criticism of the system in the United States of America is noted among leading surgeons there, notably Frank Lahey and Donald Munro. Too much of the students' time is taken up, so they say, with academic exercises, and too little practical training is given in the large teaching hospitals. To overcome this difficulty, some schools "farm out" their students to general practitioners, for a month or more, so that they see the ordinary surgical and medical diseases and not only the rarer conditions which find their way to the specialist surgeon. This system is now being tried in Melbourne. The purpose of the medical course is to train good doctors, and 90% of them will be general practitioners, still the backbone of the medical profession, the front-line soldier in the fight against disease.

Acknowledgements.

My thanks are due to Mr. Farrar Brown and Major-General Bullen Smith and the Nuffield Foundation Trustees for arranging my tour of medical schools in Great Britain, for a grant in aid to cover extra expenses, and for their hospitality in London. Also to the Rockefeller Foundation for valuable assistance in planning a tour of schools in the United States of America and for a grant in aid to cover personal expenses in that country. For the many personal kindnesses shown me by colleagues abroad I can only say, I should like to do the same for you. Finally, I thank the Vice-Chancellor, Sir John Medley, and Professor R. D. Wright, Dean of the Faculty of Medicine of the University of Melbourne, for their advice and help. A full report has been submitted to the Council of the University of Melbourne.

ANURIA.[1]

By JAMES ISBISTER, M.R.C.P., M.R.A.C.P.,
Sydney.

ANURIA, or suppression of urine, may be defined as the failure or inability of the kidneys to secrete urine. Obviously it must be distinguished from retention of urine. For the purposes of this discussion, it is proposed to include also severe oliguria when this is due to diseases which at some phase, or in a more severe form, could give rise to complete anuria. In practice, one may be confronted with a patient who is passing only two or three fluid ounces of urine per day, and who is just as seriously ill as if no urine at all was being passed. It is impossible to state a volume of urine which is "adequate", as the concentration as well as the volume indicates the efficiency of the kidneys as an excretory mechanism.

The subject of anuria has assumed more importance for two reasons: (i) the increased incidence due to experiences of severe shock and crushing injuries during the late war, the increasing use of blood transfusions, and the use of other therapeutic agents which have potentially dangerous effects on the kidneys; (ii) the changing views on the therapeutic measures to be adopted, from conservative treatment to the use of artificial kidneys.

To give some idea of the rapidly changing therapeutic methods, let me quote from the "Queries and Minor Notes" section of *The Journal of the American Medical Association* of July 21, 1945 (it is pointed out in the journal that the answers are prepared by competent authorities):

> Alkalinization, renal decapsulation or sympathectomy, renal pelvic lavage, blood and plasma transfusions, and many other procedures have been advocated. In any event it seems logical to maintain an adequate fluid intake and blood volume. . . . For prophylaxis . . . sodium bicarbonate solution is used by mouth or vein, 1500 c.c. of isotonic (one-sixth molar) sodium bicarbonate should be given daily in divided doses. . . . For therapeutic use with already developed anuria, these doses may not be sufficient, and can safely be tripled the first day. . . .

In 1951 such treatment would be calculated to produce a fatal result.

Ætiology.

Many classifications have been used for anuria on an ætiological basis, and these do not always correlate with the pathology. The following classification is convenient, though there is some overlapping:

1. Pre-renal causes. A drop in the recorded blood pressure to 70 to 100 millimetres of mercury causes the systolic pressure in the afferent glomerular arterioles to fall to between 40 and 60 millimetres of mercury, at which level the secretion of urine ceases. Such a state of affairs may occur in the following conditions: shock due to burns, hæmorrhage, operative or accidental trauma, alkalosis *et cetera.*

2. Renal causes. The following are classed as renal causes: (*a*) Acute nephritis. (*b*) Toxic nephrosis, from mercurial salts, phenol and carbon tetrachloride. (*c*) Reflex causes, giving rise to a medullary shunt (Trueta, 1946)—renal colic, urinary instrumentation and operation, and operations on other organs. (*d*) Lower nephron nephrosis (Lucké, 1946) or pigment nephrosis, from incompatible blood transfusion, black-water fever and other causes of intravascular hæmolysis, crush syndrome, heat stroke, alkalosis, post-abortional state, protracted shock after hæmorrhage, burns, operative procedures, and sulphonamides, especially sulphapyridine and sulphathiazole. (*e*) Bilateral cortical necrosis in pregnancy.

3. Post-renal obstructive causes. These include bilateral ureteric calculi, sulphonamide crystal obstruction, and renal hæmorrhage as after excessive doses of dicoumarol.

[1] Read at a meeting of the New South Wales Branch of the British Medical Association on April 26, 1951.

Pathology.

There is considerable difference of opinion regarding the basic pathological lesion in the kidneys, and how these lesions lead to the clinical characteristics and biochemical features. No finality has been reached in this regard yet, but it is worth stating the various theories and facts that have been advanced.

Pre-Renal Causes.

In all the states classified as pre-renal causes the low blood pressure in the glomerular capillaries leads to diminished rate of flow and a lowered filtration pressure. The result is a low glomerular filtration rate. If these conditions continue for sufficiently long, then a further effect is produced on the distal portions of the tubules, lower nephron nephrosis, which will be explained below. This tubular change is due to diminished blood supply.

Renal Causes.

Acute Nephritis.—The lesion in acute nephritis is well known as a capillaritis affecting the glomerular tuft and causing ischæmia, with the result that the blood flow through the glomerular tuft is reduced even to nil. The effect of this is a pronounced diminution of the glomerular filtration rate.

Toxic Nephrosis.—The effect in toxic nephrosis is almost entirely on the distal portions of the tubules. There is necrosis of the epithelium, and the lumen is filled with the shed debris. The result is that the glomerular filtrate is partly or completely reabsorbed in an entirely unselective manner. As well, there is an obstructive element due to the debris contained in the lumen.

Reflex Causes.—Trueta (1945) originally demonstrated the possibility of nervous stimuli during an intrarenal shunt of blood away from the main cortical glomeruli to the juxtamedullary glomeruli, from which it is rapidly returned again to the venous system. The effect is again diminution in the glomerular filtration rate. Experimentally in the rabbit, this effect can be produced by stimulation of the sciatic nerve, the nerves of the renal pedicle *et cetera.* As a secondary effect this renal ischæmia may give rise to lower nephron nephrosis. This mechanism has not been demonstrated in man.

Lower Nephron Nephrosis.—Lower nephron nephrosis was first reviewed in a large series, and named, by Lucké (1946). In reviewing a series of 538 cases in the United States Army, he found that many different ætiological factors, listed previously, produced an identical pathological picture. The fundamental factor appeared again to be renal ischæmia. This gave rise to degenerative changes in the ascending limbs of Henle's loops and second convoluted tubules, and later necrosis of the tubular epithelium. The lumen was filled with pigment casts, which in the crush syndrome contained myoglobin but in transfusion reaction contained hæmoglobin derivatives. These casts produced some evidence of obstruction, though this was probably a secondary effect in the production of anuria. From this finding of pigment casts this syndrome is often called pigment nephropathy, though it is now considered that the presence of casts and the type of pigment are not of vital importance. Further discussion of the ætiological factors and pathology of this interesting condition, especially in relation to battle casualties, will be found in a paper by Snyder and Culbertson (1948).

Bilateral Cortical Necrosis.—Bilateral cortical necrosis appears to be peculiar to pregnancy and will not be discussed in this paper.

Post-Renal Causes.

Post-renal causes are not truly disturbances of urine secretion, but the effect is similar, a pathological picture similar to lower nephron nephrosis often being produced secondarily. In sulphonamide anuria the most usual place for blockage to occur is the lower end of the ureters, but another type may occasionally appear where the blockage appears to be in the tubules and the ureters are unobstructed (Miller, 1949).

General.

It will be seen that in the pathogenesis of anuria the glomeruli play little or no part except in acute nephritis. On the other hand, the main difference of opinion occurs mostly in the emphasis laid on the circulatory changes, and in that laid on the tubular changes. Previously the lack of consistency in the histopathological picture, and the known liability of the tubular epithelium to post-mortem change, led to neglect of the part played by the tubule in anuria. Attention was first focused on the tubule in this connexion by Bywaters (1941) in his work on the crush syndrome.

In the healing process, except in acute nephritis, regeneration of the tubular epithelium commences as early as the third day, is well seen by the seventh day, and is usually complete by the fourteenth day, although at this stage the tubules do not necessarily function normally.

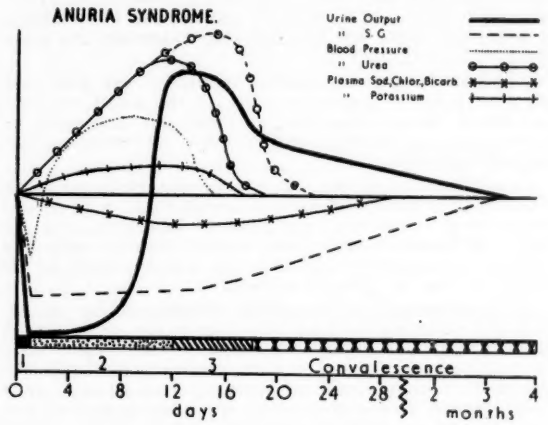

FIGURE I.

Diagram illustrating the trend of the blood pressure, urinary and blood findings during the three phases of anuria and convalescence.

Clinical Features.

It has been said that a patient suffering from acute renal insufficiency may appear "in vibrant health in the ward but be practically dead in the laboratory". This is no exaggeration when one contemplates the conscious cooperative patient who has a blood urea value of over 500 milligrammes per 100 millilitres of blood and is passing no urine. We must realize therefore that the laboratory can be of great assistance in the management of these patients.

The clinical course is usually divided into three phases and has been well studied by Muirhead and Hill (1948).

Phase 1. Hypotension.

The first phase is that during which renal damage occurs. Hypotension or circulatory failure is usually present, but may be transient only in certain conditions. This phase usually lasts only a few hours and as the blood pressure rises the patient passes to Phase 2.

Phase 2. Renal Insufficiency.

Oliguria or anuria is the outstanding clinical feature of Phase 2, though often this has to be sought. We are all familiar with the patient in hospital under observation for some condition who has been anuric for twenty-four hours or more before we realize that such a state exists. Any patient passing less than 500 millilitres of urine in twenty-four hours should be considered to be suffering from this syndrome until proved otherwise. Azotæmia is the other outstanding feature, sometimes discovered to our discredit by a "routine" blood urea estimation before we realize that the patient is oliguric.

Clinical Appearance.—The patient is usually mentally alert for five to eight days. In the more severe cases the patient may display slight mental dulness. The blood pressure is usually moderately elevated. Should the condition progress to a fatal conclusion, usually after ten to fourteen days, the end may come rapidly without the occurrence of other symptoms or signs. Many of the symptoms associated with this syndrome are due to mismanagement, especially overhydration. Muscular twitchings, irrational talk, excessive hypertension, convulsions and coma are due to this cause.

Urinary Findings.—The urine output usually increases slightly from the fifth to the eighth day. The output then increases more rapidly to a peak of the diuresis, about the twelfth day. The urine reaction is usually acid. The specific gravity is fixed between 1005 and 1010, and the urinary content of urea and sodium chloride is very low. What little urine there is contains albumin, red cells, white cells and granular casts containing pigments.

Blood and Serum Findings.—The blood urea value usually reaches a peak of 300 to 500 milligrammes per 100 millilitres in eight to fourteen days. The plasma bicarbonate level falls with resultant acidosis. The blood chloride and sodium values are likewise lowered. The serum potassium level is moderately raised, especially with transfusion reactions and traumatic conditions.

Phase 3. Diuresis.

Phase 3 constitutes the early period of recovery. With the increased urine output there is usually excessive sodium chloride loss, as the tubules have not recovered their ability to reabsorb water and salt. The specific gravity tends to remain low, and the patient may become somewhat dehydrated. The blood urea begins to fall at the height of the diuresis and returns to normal values within a week. In convalescence polyuria is manifested for a variable time, and renal function usually becomes completely normal again in two to four months.

Prognosis.

Except in bilateral cortical necrosis of the kidney, or in the presence of previous renal disease, one can expect reestablishment of renal function at least adequate for health. Previously a mortality rate of 50% to 60% was associated with all cases of acute renal failure. It might also be said that the more energetic one was in attempting to "force" the kidneys by intravenous administration of sodium sulphate, plasma transfusion, excessive water and minerals, the more did the mortality approach 100%. Recent work indicates that untreated suppression of urine, uncomplicated by continuance of the exciting causes or previous renal disease, has a relatively good prognosis.

Useful prognostic guides are the urine output and the concentrating power of the kidneys for urea. The specific gravity does not help much in prognosis (Muirhead and Hill, 1948).

Treatment.

Prophylaxis.

Many patients would be spared the dangers of acute urinary suppression if more careful prophylaxis was adopted. In general practice the careful use of sulphonamides is the most important. Other therapeutic substances which should be used with appropriate care are mercurial diuretics, carbon tetrachloride and dicoumarol. Any state of profound shock should be prevented or corrected immediately, and continued care should be taken with all cross-matching prior to blood transfusion. As Tracy (1950) suggests, perhaps all urological instrumentation should be carried out with anæsthesia to prevent reflex anuria by means of a renal shunt.

Management of Anuria.

As with the clinical course, the treatment is different in the three phases of the disease.

Phase 1.—In Phase 1 the exciting cause should be corrected. This applies particularly to those states associated with severe shock and blood loss. The blood volume

should immediately be restored by plasma or blood transfusion, whichever is applicable, but it is most important not to overdo this therapy.

In certain circumstances it is also necessary to perform immediate cystoscopy and bilateral ureteric catheterization. This should be done if there is a history of pain suggesting renal colic, taking of sulphonamides or pronounced hæmaturia, or whenever there is the slightest possibility of an obstructive element. If obstruction is found, then it should be relieved, or if this is impossible, bilateral nephrostomy should be performed (Miller, 1949).

In cases of reflex anuria it is reasonable to perform a splanchnic block or induce spinal anæsthesia (Black and Stanbury, 1948).

Phase 2.—(*a*) Water balance. All are now agreed that the maintenance of water balance is the most important principle of all. In the absence of vomiting, water loss is limited in the anuric patient to the skin, lungs and fæces. Under normal conditions this loss amounts in the adult to 500 to 1000 millilitres per day, the main variable being the loss from the skin which depends largely on the environmental temperature and humidity. The total intake per day should therefore be limited to one litre, to which may be added the volume of any fluid lost by other routes, including the kidneys if diuresis is commencing. (*b*) Mineral balance. Those who advocate conservative forms of therapy advise electrolyte starvation (Bull, Jockes and Lowe, 1949; Black, 1950). They suggest that any vomitus be filtered through lint and replaced in the stomach by means of a stomach tube. These authorities recognize that sodium, chloride and bicarbonate deficiency occurs, but feel that it is impossible to correct it without introducing excessive quantities of cation. They also believe that these disturbances do not prevent the onset of diuresis. If one is going to enforce mineral starvation, then it is a useful practical point to write in red ink across the top of the treatment sheet "No medicines containing minerals". It is very easy for a house doctor unwittingly to order potassium bromide or potassium citrate. (*c*) Nitrogen metabolism. Endogenous and exogenous nitrogen metabolism should be depressed as far as possible. End-products other than urea are toxic and a considerable amount of potassium is also liberated in endogenous nitrogen metabolism. Exogenous nitrogen in protein can be easily stopped. Endogenous nitrogen metabolism is depressed by supplying adequate Calories—up to 2500. Bull *et alii* (1949) have used a fluid diet, which is administered by stomach tube, containing 2500 Calories per day made up of 400 grammes of glucose, 100 grammes of fat, and no minerals. The preparation is as follows: glucose, 400 grammes; peanut oil, 100 grammes; acacia, sufficient to emulsify (vitamins optional); water, to one litre. This emulsion is nauseating to take and is best given by means of a stomach tube, either intermittently or by continuous drip. A number of authorities advocate artificial means of removing waste products of protein metabolism and of adjusting alterations of the blood minerals. These will be discussed briefly later.

Phase 3.—The fluid intake by mouth should now be one litre *plus* the volume of urine passed in the preceding twenty-four hours. When the urine output exceeds one litre per day a diet of low protein content given by mouth may be used. Sodium chloride will probably have to be given to replace that which the damaged kidney has difficulty in retaining. If anæmia is present at this stage it is suggested that a transfusion of fresh packed red cells be given (Bull *et alii*, 1949).

Convalescence.

A full diet may be employed but excessive work should not be demanded of the kidneys, such as dealing with large quantities of water, minerals or end-products of protein metabolism.

The conservative form of treatment outlined above is simple to carry out and does not require elaborate apparatus, special skill or close laboratory control. It has given good results in the hands of those who have published results. Similar conservative methods are advocated by Collier (1948), Muirhead and Hill (1948) and Fowler and Hunt (1950).

Other Methods of Treatment.

The different methods of treating anuria are well reviewed by Snapper (1949).

Decapsulation of the Kidneys.—In the past renal decapsulation enjoyed a high position in the rather desperate treatment applied in cases of anuria. It was supposed to relieve the tension in the kidney as a result of œdema. It is also thought to produce benefit by denervating the kidney. With modern methods of treatment this operation does not appear desirable or entirely rational.

Peritoneal Dialysis.—Peritoneal dialysis was first introduced as a life-saving measure in human beings by Fine *et alii* in 1946. Since then it has been used quite extensively, especially in the United States of America. The main disadvantage is the ever-present complication of peritonitis, which develops in most patients so treated for more than a few days. The apparatus is elaborate and close laboratory control is necessary. Full details are available in a further paper by Fine (Frank, Seligman and Fine, 1948).

Intestinal Irrigation.—Colonic irrigation was first used but proved to be ineffective. Use of the small intestine has given more encouraging results, but difficulties of method and control of electrolytes have not yet been satisfactorily overcome.

Exsanguino-transfusion.—The principle of exsanguino-transfusion is good, and dangers are minimal with careful cross-typing. However, execution is laborious, and the supply of adequate donors will always remain a difficulty. The method is popular in France and a recent paper on the subject is that by Dausset (1950).

Cation-Exchange Resin.—Such substances as cation-exchange resin can be used either internally or externally with an artificial kidney. Elkinton *et alii* (1950) have recently reported the use of such a resin administered by enema for the purpose of removing potassium. As a rising plasma potassium level is the main danger of conservative forms of treatment, this may prove a useful adjunct in such cases.

The Artificial Kidney.—The artificial kidney was first introduced for human use by Kolff (1947). A lot of work has been done by others since, as it appears that if conservative methods are not going to be of avail then this offers the best supplementary method. It still requires elaborate apparatus, experienced skill and adequate laboratory control. Kolff (1950) adds further to his experience, but the best article on the subject is that from the Peter Bent Brigham Hospital in Boston (Merrill *et alii*, 1950). This describes the technique and clinical use very satisfactorily. Quite recently Lowsby and Kirwin (1951) have described commercial types of artificial kidneys.

Summary and Conclusions.

1. The subject of anuria has assumed increased importance in recent years. During World War II anuria was a not uncommon happening after severe injury. Therapeutic measures such as blood transfusion and the use of sulphonamides have also tended to increase the incidence. Modern therapeutic methods have improved the prognosis enormously.

2. The ætiological factors, pathology and clinical features are discussed in some detail.

3. In the management, special emphasis has been placed on prophylaxis. For this purpose a thorough knowledge of ætiological factors is essential, with particular reference to the prevention or early treatment of states of profound shock. The hazards of certain commonly used therapeutic measures are also stressed.

4. A strong case is stated for conservative treatment during the phase of urinary suppression. The main principles are restriction of fluids, deprivation of electrolytes, and depression of nitrogen metabolism by a high caloric intake with absence of protein. This method gives good results and is well suited to hospitals which have not the

special apparatus, experience and laboratory assistance required for the more elaborate methods.

5. Other methods of treatment are briefly discussed.

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ANURIA IN OBSTETRIC PRACTICE.[1]

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WHILST a number of the conditions encountered in obstetric practice may be complicated by severe oliguria or anuria, such a catastrophe is fortunately rare. At the King George V Memorial Hospital we encounter on an average some two or three cases each year, though of late we have been more fortunate and we have not encountered a single case during the past twelve months.

Apart from the ætiology, however, the problem is little different from that faced by the physician, although we have the advantage of knowing that almost all the patients are young, healthy adults with previously normal renal function. The chronic nephritic rarely retains a pregnancy long enough to develop severe oliguria. Thus it is reasonable to assume that, if the patient can be kept alive for long enough (usually two or three weeks), complete or almost complete recovery can be expected.

The second world war has added greatly to our knowledge of this subject, firstly because of the investigations which were made into the "crush syndrome", leading on to those of Trueta and his team of workers at Oxford (1947), and secondly, by the practical application of studies regarding the survival of aircrew and troops under conditions of starvation and minimal intake.

Oliguria in obstetric practice is nearly always associated with one of three groups of conditions—abortion, toxæmia of late pregnancy (particularly when complicated by accidental hæmorrhage), and the transfusion of incompatible blood. From the pathological point of view the cases also fall almost entirely into two groups—lower nephron nephrosis (comprising almost all the abortion group and many of the later cases) and symmetrical cortical necrosis. Rarely obstructive cases may occur from sulphonamide deposition, whilst reflex anuria is also a rare possibility.

Abortion may cause a lower nephron nephrosis in a number of ways. Several of the popular abortifacients, including some soap solutions, mercury and quinine, may produce it, as may a variety of bacterial toxins, whilst a number of cases have been reported in which anuria has been associated with abortions in the apparent absence of infection (O'Donnell, 1949). This effect has been likened by Young (1942) to the crush syndrome, the placental debris being considered to be equivalent to devitalized muscle. The commonest cause in this group in Sydney is probably infection due to *Clostridium welchii*, which accounts for nearly half our cases, the effect being largely due to the hæmolytic anæmia which is produced. In addition, the aborting woman runs a small risk of being given an incompatible blood transfusion or of developing a lower nephron nephrosis caused by the sulphonamide drugs.

In late pregnancy and during the puerperium the risks of blood transfusion are again evident. The main hazard, however, follows concealed or severe revealed accidental hæmorrhage, which is nearly always associated with one or other type of toxæmia. These are particularly alarming, as the patient is already gravely ill. Either a lower nephron type of lesion or symmetrical cortical necrosis may follow accidental hæmorrhage, but symmetrical cortical necrosis, although it has been reported following abortion, is extremely rare in early pregnancy. It is of interest to consider a case reported by Mauzy and Donnelley (1949), in which anuria supervened after concealed accidental hæmorrhage. On the third day the right kidney was decapsulated and a biopsy was taken; bilateral cortical necrosis of the kidney was diagnosed. Eight days later the patient died of pulmonary œdema and sections of the kidneys were examined, the picture being fairly typical of lower nephron nephrosis. This was reported without comment, but the description of the biopsy section was somewhat suggestive of a lower nephron lesion throughout. It does, however, illustrate the extreme difficulty, perhaps impossibility, of making an accurate clinical diagnosis unless the patient comes to autopsy, and we can only assume without any certain proof that some of the patients with symmetrical cortical necrosis do recover. From the patient's angle the question of accurate diagnosis is of little importance. The fact that renal excretion has failed is all that matters, and the management does not differ in any significant way.

Symmetrical Cortical Necrosis of the Kidney.

Symmetrical cortical necrosis of the kidney is a rare condition. It may occur quite apart from pregnancy, occasionally even in the male, and has been attributed to an extraordinary variety of causes; in some cases no cause could be found even at autopsy. However, almost two-thirds of the reported cases occurred late in pregnancy or during the puerperium, particularly when pregnancy had been complicated by severe toxæmia and frequently, in addition, accidental hæmorrhage (Duff and Murray, 1941).

[1] Read at a meeting of the New South Wales Branch of the British Medical Association on April 26, 1951.

The clinical picture differs little from that seen in anuria due to other causes. It is usually complicated by signs and symptoms due to its cause, and may at first be overlooked. Oliguria usually precedes anuria, the urine being blood-stained, though otherwise it resembles glomerular filtrate. Diarrhœa and vomiting are common, being reported in about 50% of cases. The temperature is usually raised to about 100° F., and leucocytosis is usual, the white cell count generally exceeding 15,000 per cubic millimetre. Œdema, too, is common. The patient often remains mentally clear until late, when drowsiness and coma may supervene. The blood urea, blood creatinine and blood non-protein nitrogen levels generally rise to very high levels. In confirmed cases death has been usual in four to twelve days, and at autopsy necrosis may also be found in the hepatic lobules, the pancreas or the pituitary.

The Management of Anuria.

First let us consider in brief the more important biochemical disturbances which occur in the starving, anuric patient. After a short time—the process being hastened by shock and vomiting—the carbohydrate reserves disappear. For metabolic needs mainly fats and protein are catabolized, about 70 grammes of the latter being used each day. The combustion of these substances produces or releases nearly 0·5 litre of water per day, and also sets free a considerable amount of potassium, which is normally intracellular, in addition to the well-known nitrogenous waste products. In cool weather the patient loses on an average one litre of water daily *plus* the loss from vomiting and, if she is merely oliguric, the volume of urine excreted; in hot weather, or should the patient be pyrexial, sweating or suffering from diarrhœa, the loss will be greater; acidosis tends to supervene. Finally, it must be remembered that the only loss of electrolytes that can occur is through vomiting, defæcation or frank sweating. Our scheme of treatment must be designed to minimize or counteract the adverse effects, therefore, of three disturbances—those of fluid balance, electrolyte balance (particularly sodium chloride and potassium) and the retention of nitrogenous waste.

It is evident that first of all we must treat the cause if this is possible. Infection must be treated with the appropriate drugs, and in the case of *Clostridium welchii* infection with generous doses of antiserum. As a general rule the infected placental debris should be removed as soon as is practicable. Even when there is no infection the prophylactic use of penicillin is wise throughout the treatment, as any infection or pyrexia will increase metabolism. Anæmia must be treated, if necessary by blood transfusion, as it tends to lower renal function; even when there is a hæmolytic state this is usually practicable; the use of packed cells is often to be preferred in the early stages.

When the cause of lower nephron nephrosis is a hæmolytic state, usually caused by the transfusion of incompatible blood or by a *Clostridium welchii* infection, it has been the custom in the early stages to attempt to minimize the deposition of acid hæmatin in the tubules. With this object large volumes of M/6 sodium lactate solution are frequently infused. Whilst in moderation this may do no harm, it is doubtful whether it does much good (Scott, 1949). It is an example of shutting the stable door after the horse has gone. The most important preventive method, apart from scrupulous care in cross-typing, is the early clinical recognition of the signs and symptoms of an incompatible transfusion and its prompt cessation. Some authors advocate the immediate transfusion of truly compatible blood as a therapeutic measure.

With regard to treatment, a period of anuria may be regarded as consisting of three phases. First there is the phase of onset, usually accompanied by shock due to the cause of the anuria, and also by signs and symptoms due to this cause. At this stage, unless the nursing staff are alert, it is easy to fail to recognize the impending anuric state. If shock is evident it must be treated by fluid or blood replacement in the usual way, and the primary cause, too, must be recognized and treated. The second phase is that of severe oliguria or anuria, and usually lasts for about six to ten days, oliguria most frequently preceding actual anuria. The final phase is that of recovery of renal function going on to diuresis, during which time a considerable amount of sodium chloride may be excreted. It is important to remember that many of the fatalities occur at this time, and that the return of renal function does not denote recovery of the patient. The strictest supervision of fluid intake is still essential. By far the commonest mode of death for many years has been pulmonary œdema; that is to say that, despite or even because of the treatment given, the patient has drowned. Strauss (1948) points out that in the era before intravenous infusion of fluid became popular it was not unusual for a totally anuric patient to survive for as long as a month with little or no treatment. Therefore our first object must be to prevent water-logging, though there are still schools of thought which think so little of this risk that they advise the plentiful administration of fluid to dilute the toxins which are present. There is no doubt, however, that most of those who fail to survive die a watery death. Secondly, we can minimize protein catabolism by suitable dietetic measures. In addition we should give nothing which may do harm (notably sodium chloride, which will increase fluid retention and water-logging), we can combat acidosis, and we can resort to surgery or use artificial methods of excretion. Finally, during the diuretic phase we can modify the régime selected to allow an adequate but not excessive replacement of fluid and of electrolyte.

Borst (1948) used a carbohydrate-rich diet which was almost protein-free and demonstrated that such a régime resulted in a considerable lowering of protein catabolism. A team of American workers on minimal survival diets in unpublished experiments quoted by Gamble (1947) have shown that the administration of 100 grammes of glucose daily to a starving man lowers protein catabolism by approximately 50%, whilst the administration of 200 grammes daily causes little further reduction. Furthermore, the excretion of potassium in the urine is also reduced by 50%.

Two contrasting régimes of treatment have been planned, based on these biochemical principles. Strauss (1948), of the Cushing Veterans Administration Hospital, employs the intravenous route. Since the administration of 100 grammes of glucose is almost as effective as that of larger quantities, he regards this as adequate. He also points out, as was mentioned earlier, that protein catabolism during starvation leads to the freeing of almost half a litre of water per day, and if this is halved after the administration of glucose about 250 millilitres of water will be released. In fact, the amount of 100 grammes of glucose itself contributes approximately 60 millilitres of water when it is metabolized. Therefore, only 750 millilitres of 15% glucose solution are given daily by very slow intravenous injection. More concentrated solutions tend to cause venous thrombosis, which must be watched for even when the 15% solution is used. Nothing whatever is given by mouth, as this increases vomiting. Any vomitus is measured and is replaced by an equivalent volume of normal saline solution. Acidosis is treated when clinically and chemically evident by the administration of a litre of M/6 sodium lactate solution, which adds to the body fluids. Every second day an electrocardiogram is taken in an attempt to detect potassium toxæmia, for which Strauss offers no simple treatment, although lavage through a duodenal tube is suggested. When diuresis commences the permitted daily intake is one litre *plus* the volume of urine passed on the day before *plus* its measured content of sodium chloride. A blood transfusion is also often indicated at this stage.

On the other hand, Bull, Joekes and Lowe (1949) at Hammersmith pass a fine plastic indwelling stomach tube. They believe, as a result of Borst's work, that the minimum of protein catabolism is achieved when there is no protein intake whatever, provided that an adequate caloric intake is maintained. Therefore they give daily, by a slow

drip method, the following: glucose 400 grammes, peanut oil 100 millilitres, acacia *quantum sufficit*, water to one litre. This provides an intake of the order of 2500 Calories per day. Any vomitus is carefully strained and returned into the drip fluid. Penicillin is given throughout the treatment, but they consider that 45,000 units given every five days are sufficient during anuria.

With both régimes vitamins may be added if so desired. Obviously a close physical check is maintained, particularly of the condition of the lung bases and of the heart, and the usual biochemical tests are performed regularly.

Sympathetic nerve block and the use of adrenergic-blocking agents have no place in the treatment of anuria. Decapsulation of the kidney does seem on occasions to be of value, although the rationale for its use is often assailed. However, the greatest problem to be overcome is that of dealing with a dangerously high serum potassium level. If such an apparatus is available an artificial kidney may be used, but peritoneal lavage is more practicable, although the risk of peritonitis is considerable. Recently Vallery-Radot (1947) has used exsanguination transfusion in the treatment of anuria, replacing five to eight litres of blood daily or every second day, sometimes using peritoneal lavage in addition. He and other French authors report success with this routine.

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BY AND ABOUT OSLER: FIVE NEW BOOKS.

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IN celebrating the centenary of Sir William Osler's 1849 birth, a large number of medical journals in the United States and Canada published either single articles about him during 1949 and 1950 (such as the *North Carolina Medical Journal*, with an Osler article in each issue), or printed a "William Osler Memorial Number" (such as the July-August, 1949, issue of the *Bulletin of the History of Medicine*, with all the articles about him). Also, the publication of five contributions to Osleriana books seems to confirm Dr. Joseph H. Pratt's conviction that "the mark [of a] truly great man is that his greatness is more and more appreciated as we move farther away, [and] time has only served to increase the eminence of [Osler's] position as a man and a physician".

Dr. Pratt, a member of the Johns Hopkins class of 1898, has written "A Year with Osler, 1896-1897" (1949), based almost entirely on the exact words of Sir William Osler during these early years in Baltimore, Maryland. This was the time when Osler's gifts as an inspirer of youth came to be truly appreciated. After a sixteen-page introduction in glowing tribute to William Osler's personality and influence, the book fully records the notes taken at Osler clinics in the Johns Hopkins Hospital from October 6, 1896, to May 15, 1897. The clinics were given in a bare room, the students in a semi-circle around the patient on a couch and Osler seated at a plain deal table. A history was taken and what could be learned by simple observation was stressed. Under Osler's guidance the students saw what they had not previously noted, and they were taught that "to see, to touch and to hear", as well as "auscult", all went for naught if they did not "record". Entry after entry in the volume shows Osler's "Gallic clarity of style" in words "terse, pithy and pregnant with the wisdom of ripe experience".

"John Ferriar [and] William Osler", by Dr. Edward M. Brockbank (1950), is devoted primarily to Ferriar, one of the early medical leaders in the movement in Manchester and other British manufacturing towns to overcome insanitary slums, to prevent disease, and to improve working conditions. The author of a critical study of novelist Laurence Sterne, and of a "Bibliomania", a verse satire of the disease of book-collecting, Ferriar would have attracted Osler. Dr. Brockbank dedicates his book to Osler, who first encouraged him to write it, and has seven pages on "William Osler in Manchester". This section tells of two visits in 1906 and 1912 and ends with a brief note on Osler's interest in Ferriar, whom he considered "an enterprising fellow and far ahead of his generation".

"Sir William Osler: Aphorisms from his Bedside Teachings and Writings" (1950), collected by Dr. Robert Bennett Bean (1847-1944) and edited by his son, Dr. William Bennett Bean, is a wholly delightful little book of 357 "burrs that stick in the memory". Some examples of these short epigrams, which Dr. John F. Fulton states in the foreword are "as pertinent to the modern student as on the day they were written" at Johns Hopkins in 1903-1905, are as follows: "Avoid wine and women—choose a freckle-faced girl for a wife; they are invariably more amiable." "Never hide the work of others under your own name." "Acquire the art of detachment, the virtue of method, and the quality of thoroughness, but above all the grace of humility." "We are here to add to, not to get what we can from, Life." "Look wise, say nothing, and grunt. Speech was given to conceal thought." The final aphorism is the one which Osler wished to be his epitaph: "I taught medical students in the wards."

"The Selected Writings of Sir William Osler" (1951) has been chosen by a committee of the Osler Club of London from the most important of William Osler's essays and addresses given in the United States of America, Canada and Great Britain. The sixteen selections will introduce to a new generation of readers a man who stood for the finest in medicine, who had breadth of learning, a wide intellectual background, a civilized, individual and well-rounded point of view. With the clinical notes that Dr. Pratt has assembled, and the aphorisms from the data Dr. Bean has collected, this new anthology of Osler's literary, historical and vocational writings will give the young student something to balance his training in the classroom and the hospital wards.

My own "Sir William Osler: Historian and Literary Essayist" (1951) is a reprint in pamphlet form of a paper read at a meeting of the Section of Medical Literature and History, Australasian Medical Congress (British Medical Association), Seventh Session, in Brisbane on May 31, 1950, and printed in THE MEDICAL JOURNAL OF AUSTRALIA of September 23, 1950. It deals with the historical and literary qualities of Osler's biographical, inspirational, pedagogical and bibliographical writings. Their content and form, and Sir William Osler's charm of style, place them among the best didactic essays of our day.

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INTENSIVE OXYGEN THERAPY AS A POSSIBLE CAUSE OF RETROLENTAL FIBROPLASIA: A CLINICAL APPROACH.

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Melbourne.

THE fœtus in the uterus is cyanosed. This is partly due to the fact that none of the arteries in his body carries pure arterial blood, even the head being supplied with mixed arterial and venous blood. Also, the oxygen conditions of the fœtus are poorer than those in extrauterine life. It has been shown (Smith, 1946) that the oxygen content of the blood in the umbilical vein is lower than that of the arterial blood of extrauterine life. At birth, with the cessation of the fœtal circulation, the arterial and venous streams become separate. Also, with the establishment of pulmonary respiration the blood becomes better oxygenated. Thus within a very short space of time the hypoxic fœtus becomes the infant with a higher oxygen environment to his cells.

This change must require some adaptation on the part of the new-born baby. We are so accustomed to think of oxygen as universally beneficent that it is a new approach to think of this better oxygenation as a risk or hazard which the baby may not satisfactorily surmount.

This risk, if present, must be considerably increased in the case of the premature infant; the more premature the infant, the greater the risk. An infant born at twenty-eight weeks' gestation should physiologically have been hypoxic and cyanosed for a further twelve weeks. At birth such an infant with his immaturely developed tissues is subjected to the same oxygenation as the full-time baby, and it is possible that to them the oxygen may be toxic. It has been shown that high oxygen concentrations (70% to 80%) are toxic to adult tissues (Best and Taylor, 1939), and one would assume that lower concentrations might be toxic to new-born tissues, particularly if premature. In this general effect the capillary walls would share. If this was so, one would expect generalized œdema to occur. Clinical observations in favour of this can be given. It is a well-known fact that premature infants show signs of œdema. The more premature the infant, the greater is the œdema. Pronounced œdema is not often seen in premature infants of five pounds and over.

I asked an experienced sister in charge of a premature ward to note the presence of œdema in a series of infants. I would class this as "nurse's œdema", since it was diagnosed by inspection, whereas the clinician by palpation would diagnose it more frequently. However, as the estimation was carried out by the one person with the same standard, it gave an indication of the relative frequency of œdema in the different weight groups. It was found that the proportion with œdema among babies of four pounds and over (68) was approximately one-tenth, among babies of three pounds and over (45) it was approximately one-quarter, among babies of two pounds and over (25) it was approximately one-third, and among babies of one pound and over (4) it occurred in all cases. This œdema may appear as early as one hour after birth, but often occurs in three to four hours. It is an unusual type of œdema, being first observable in the calves and pretibial areas before showing in the loose subcutaneous tissues. It has a typical "buttery" feel, makes the limbs look chubby, and gives the impression of being in the muscles rather than in the subcutaneous tissues. It can easily be missed unless the leg is squeezed. About the same time as the œdema appears the infant may develop a typical grunt or moan. This I take to be indicative of the œdema affecting the cerebral tissues. This moan usually disappears within about twelve hours, though occasionally it may last up to forty-eight hours. It ceases before the œdema clears, which is usually within two to five days of birth.

To say that œdema in the premature infant is due to the toxic effect of oxygen on immature fœtal capillaries and smaller thin-walled vessels is of course only an assumption, but if we carry this hypothesis further we would expect those areas of the body which have a particularly rich network of vessels, for example, the chorioid coat of the eye, or those with thin-walled or poorly supported vessels, such as the retina, brain and chorioidal plexus, to be particularly affected.

It was therefore with much interest that I heard, from colleagues returning from overseas, the suggestion that oxygen might be responsible for producing retrolental fibroplasia. The idea arose apparently from a comparison of the treatment of premature infants in America, where retrolental fibroplasia is a problem and where oxygen was used freely, with the treatment in England, where retrolental fibroplasia is seen rarely, and where oxygen was used sparingly.

It occurred to me that the generalized œdema, in which the immature eye must share, might be responsible for the early changes in the eye as reported by the Owens (1948) and others, and that this œdema might be the starting point of the subsequent changes observed. If, as suspected, the high oxygen concentration administered was the cause of the œdema, a possible mode of action of oxygen in producing the retrolental fibroplasia could be suggested.

If this was the case one would expect that, providing the rest of the management was the same, when oxygen was used extensively, as in conditions in which the facilities for its use were easiest for application and the factor of cost had not be considered, the incidence of retrolental fibroplasia would be greatest.

As I had under my care at the same time three series of premature infants, whose management was identical except for the amount of oxygen used, I was able to compare the incidence of retrolental fibroplasia in the three groups. In all groups the babies were given oxygen for twelve to twenty-four hours after birth.

The following is in the nature of a preliminary report, and I hope to publish fuller details later.

The first group, series I, was nursed in institution I. Here the oxygen was piped into the ward and was given by oxygen cot, in which the percentage of oxygen was from 40 to 60. As the infant improved the oxygen was given by oxygen tent, in which the oxygen concentration was generally lower. Cost was not a limiting factor, and the oxygen was often given prophylactically as well as during the periods of cyanosis.

The second group, series II, was nursed in institution II. Here most, but not all, of the small premature infants were nursed in an electrically heated and humidity-controlled cot. In this the oxygen arrangements were such that the gas had to be given by intranasal catheter or funnel. The others were given oxygen by cot or tent. In this series cost was not a limiting factor.

The third group, series III, consisted of private patients. Here cost was a consideration, and oxygen was therefore used with more economy. Oxygen was given mainly by tent, sometimes by oxygen cot, occasionally by intranasal catheter or funnel.

In series I oxygen was used more extensively than in the other groups. I have therefore designated this as the high-oxygen therapy group and series II and III as the moderate-oxygen therapy group.

We had previously, without success, tried excluding light from the eyes of the infants by means of black goggles, and also the Owens *régime* of giving 150 milligrammes of α-tocopherol daily and withholding vitamin *A* and iron.

In 1946 and 1947 there were no cases of retrolental fibroplasia found in infants in institutions I and II.

In 1948 the oxygen cot was introduced. This was a more efficient means of giving oxygen than the tent, the percentage of the oxygen being generally about 40 to 60.

This investigation covers the years 1948, 1949, 1950, and deals with 181 surviving premature infants whose birth weights were from one pound seven ounces to three pounds eight ounces. There were 27 cases of retrolental fibroplasia, and it is hoped to give details of the individual cases at a later date.

Most observers have found that retrolental fibroplasia occurs in infants of three and a half pounds or less at birth, and this has been our experience. I would like to stress, however, that the gestational age of the fœtus is the important factor rather than the weight, as this latter is variable. Infants who have suffered from placental insufficiency *in utero* may be a good deal below their expected weight for the period of gestation. The racial factor also affects birth weight.

All the pregnancies were of thirty-two weeks' gestation or less, with the exception of one case, in which the baby weighed three pounds seven ounces and the period of gestation was given somewhat doubtfully as thirty-three weeks. In the great majority of cases there had been thirty weeks of gestation or less.

The distribution of the cases was as shown in Table I. Thus in the high-oxygen therapy group there was an incidence of 23 cases in 123 infants (18·7%) and in the moderate-oxygen group an incidence of four cases in 58 infants. As will be seen, the figures in series III are unfortunately as yet incomplete as regards the number of premature infants of three and a half pounds or less. Actually it was a larger figure. It is, however, quite definite that only one case of retrolental fibroplasia occurred in the private patients over these three years. Thus the real incidence of retrolental fibroplasia in the moderate-oxygen groups would be less than that shown. No cases occurred in the infants in series II nursed in the electrically heated humidified crib with low-oxygen therapy.

I am informed that the different incidence of retrolental fibroplasia in these two groups is statistically significant.

During 1950 efforts were made to cut out the prophylactic administration of oxygen after the first twelve hours and to ensure that it was given only during periods of cyanosis, and the number of cases decreased.

Up to the time of writing (end of March, 1951) we have seen no fresh cases for 1951.

The duration of oxygen therapy in affected infants varied from eight days to intermittent therapy for six weeks in an infant who developed bronchopneumonia which was slow in responding to treatment.

Many premature infants had oxygen for periods of two to two and a half weeks without developing the condition, and a few for as long as four weeks without eye injury.

It would seem, therefore, that other factors must be considered. A study of some of the affected individual patients is helpful. The history of the infant who developed retrolental fibroplasia after only eight days of oxygen therapy is as follows.

The mother was a *primipara* with a normal pregnancy, who came into labour for no obvious reason at thirty weeks' gestation. The infant had a breech presentation at birth, weighed two pounds nine ounces, and required administration of "Coramine", 0·25 millilitre. When first examined at the age of five hours he was greatly overheated with a rectal temperature of 105·6° F. He was unusually bright red and had generalized œdema, also of an unusual degree. The œdema disappeared over the next two days.

I would suggest that the pyrexia, by accelerating the infant's metabolic rate and so increasing the uptake of oxygen, intensified the oxygen's toxic effect. The infant was having the Owens *régime* (α-tocopherol, 150 milligrammes daily, no iron and no vitamin *A*).

In several cases there is a history of pneumonia following an upper respiratory tract infection, or as post-atelectatic pneumonia, or following aspiration of regurgitated material. Pneumonia introduces the following three possible factors: (*a*) further oxygen therapy, (*b*) the effect of pyrexia, and (*c*) toxæmia. Any infection in the infant could similarly act in a deleterious manner.

Conclusions.

Although this investigation is only clinical, I would put forward the following suggestions:

1. The normal oxygen environment of the new-born full-term infant is abnormal for the premature infant.

2. This is particularly so for infants of thirty-two weeks' gestation or less.

3. The potential toxic effect of oxygen on premature infants can be enhanced (i) by administration of a high concentration of oxygen therapeutically, (ii) by pyrexia, (iii) by toxæmia.

4. The generalized vascular spoiling and œdema so produced affect the eye and are the starting points of retrolental fibroplasia.

If one accepts these assumptions it would appear that the prophylaxis of this condition consists in the following measures:

1. An endeavour to carry the fœtus to thirty-three weeks' gestation or more.

2. The avoidance of intensive oxygen therapy. Oxygen should be given only when the infant is cyanosed and not as a prophylactic measure. Instead of the oxygen being run at a set flow it should be cut down to the minimum which will keep the infant's colour satisfactory. In cases in which the cyanosis is due to a congenital cardiac defect vain efforts should not be made to improve the infant's colour with oxygen. It is not possible clinically to know what degree of oxygenation of a premature infant in an extrauterine environment best corresponds to the physiological intrauterine degree of cyanosis. Therefore we maintain the infant at a clinically "satisfactory colour".

3. The avoidance of overheating.

TABLE I.

Year.	High-Oxygen Therapy Group.		Moderate-Oxygen Therapy Group.			
	Series I.		Series II.		Series III.	
	Number of Premature Infants.	Cases of Retrolental Fibroplasia.	Number of Premature Infants.	Cases of Retrolental Fibroplasia.	Number of Premature Infants.	Cases of Retrolental Fibroplasia.
1948	36	6	11	2	Not collected	
1949	32	10	14	1	9	—
1950	55	7	19	—	5	1
Total	123	23	44	3	14	1

4. The prevention of infection, and, should it occur, its prompt and efficient treatment.

Acknowledgements.

I have pleasure in acknowledging my indebtedness to Dr. Hugh Ryan, who followed up the cases in series I, and to whom I am also indebted for the diagnosis in the cases, as well as for his research into the eye condition; to Dr. Adelaide Gault, who followed up and diagnosed the cases in series II; to Dr. Kevin O'Day, for his helpful demonstrations of the ocular structures; to Sister Guscott, in institution I, and Sister Price, in institution II, for their willing and unflagging cooperation; and to my obstetric colleagues for their interest and consideration.

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THE GUILLAIN-BARRÉ SYNDROME: THREE CASES IN ABORIGINAL NATIVES.

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THE Guillain-Barré syndrome is a disorder affecting predominantly the peripheral nervous system, and usually characterized by albumino-cytological dissociation in the cerebro-spinal fluid. That it has often been an ill-understood condition exhibiting itself in a variety of clinical forms is at once suggested by the number of synonyms employed by neurologists and neuropathologists at different times. Thus, although the Guillain-Barré syndrome is still the title of choice, the disease is also referred to in the literature as acute infective polyneuritis, infectious neuronitis, polyradiculoneuritis, and encephalomyeloradiculitis. Two excellent reviews on the subject have appeared in the last decade (Roseman and Aring, 1941; Haymaker and Kernohan, 1949).

Landry (1859) described ten cases of ascending muscular paralysis affecting the extremities and causing difficulty in respiration, dysarthria, dysphagia and facial weakness. Sensory changes were confined to cramps and paræsthesiæ. In the ensuing fifty years further cases of a similar nature were recorded from time to time in Continental literature (for example, Pellegrino-Levi, 1865; Westphal, 1876). Groups of cases were described in World War I, the most adequate account being given by Guillain, Barré and Strohl (1916), whose paper "*Sur un syndrome de radiculonévrite avec hyperalbuminose du liquide céphalo-rachidien sans réaction cellulaire*" is accepted as the classical description of the disease. Cases in English troops were described by Gordon Holmes (1917) and others.

Interest in the syndrome was renewed in the recent war owing to its reappearance in numbers among concentrations of troops. Speculation has arisen concerning its relation to other common viral diseases.

Clinical Features.

The syndrome is not common and is likely to be met with less frequently in peace-time conditions than in war-time. References to its occurrence in dark-skinned races are few; only Knapp and Thomas (1900) record one case in a Negro. Its main incidence is in males, of the second, third and fourth decades of life. Little is known of the epidemiology, and most cases appear to occur sporadically; certainly case to case infection is not known.

Prodromal symptoms occur in a significant proportion of cases; coryzal symptoms or sore throat are followed after a variable interval of time—two to ten days—by the onset of nervous symptoms. Occasionally the prodromata take a different form; for example, typical polyneuritis has followed "enteritis", ecthyma and cellulitis (Haymaker and Kernohan, 1949), after an interval of seven weeks, infective hepatitis (Haymaker and Kernohan, 1949; Zimmerman and Lowry, 1947), and infectious mononucleosis (Haymaker and Kernohan, 1949; Peters and Widerman, 1947). However, these prodromal phenomena are not universal, and the disease may be first manifest by paralytic events or by pains and paræsthesiæ.

Most characteristically the disease presents with the fairly sudden development of weakness and paralysis of the limbs, afflicting particularly the distal segments, and affecting the legs, trunk and arms in orderly and symmetrical sequence. Paralysis may be complete in a few days and not infrequently spreads to the bulbar muscles, causing facial weakness, dysphagia and dysarthria. This "invasive" stage is often accompanied by a low-grade pyrexia with tachycardia. Sensory disturbances may be present to greater or lesser degree, and pains, muscle cramps, formication, paræsthesiæ and numbness may be complained of. Slight disturbance of sphincter function may occur. In this type of case, which bears such a strong resemblance to those of Landry's original description, the main danger to the patient is from paralysis to the respiratory and accessory aspiratory muscles, and death may occur from this cause or from bronchopneumonia. Otherwise recovery occurs after several weeks, without sequelæ. The mortality rate has varied between 15% and 25% in different groups of cases reported.

According to whether motor or sensory units are predominantly affected, there are several variations on this clinical theme. Thus sensory phenomena may be outstanding and motor paralysis may be present to slight degree in the more peripheral segments; or, on the other hand, motor paralysis may be severe, with barely recordable objective sensory loss. Paralysis is more severe in the distal groups of muscles—more severe, that is, in the flexors and extensors of the wrist than at the elbow, for example. The tendon reflexes are diminished or absent. Motor ataxia of the limbs is present. Minor or major loss of deep or cutaneous sensation may be discovered; this is generally confined to the distal portions of the limbs in the "glove and stocking" distribution. The cranial nerves most commonly affected are the seventh and, less frequently, the third, fourth, sixth, ninth, tenth and twelfth.

Recently Brown and Baker (1947) have redrawn attention to the multiform clinical picture of infective polyneuritis. They classify the condition into the following groups of cases: (i) a mononeuritic "*forme fruste*", the true diagnosis of which may very well be missed unless routine cerebro-spinal fluid studies are carried out; (ii) the typical polyneuritic form; (iii) a myelitic form with early and severe reflex bladder dysfunction; (iv) a very rare cerebral form. In the last-mentioned instance it is to be noted that transient neck stiffness and Kernig's sign may be present in the polyneuritic form, indicating a slight meningeal reaction; but objective signs of encephalitic involvement are absent.

The cerebro-spinal fluid changes which featured so prominently in Guillain's diagnostic criteria are characteristic. Pleocytosis is rarely encountered, whereas it is usual to find at some stage of the disease some rise above normal of the protein concentration. Earlier Continental literature recorded astonishing levels; 1000-2000 milligrammes per 100 millilitres in Guillain's experience were not rare findings. However, in later studies (for example, Haymaker and Kernohan, 1949) a mean figure of 120 milligrammes of protein per 100 millilitres is the more usual finding (normal, 20 to 50 milligrammes per 100 millilitres).

Pathology.

The extensive pathological studies of Haymaker and Kernohan (1949) on the material obtained from 50 fatal cases of the disease occurring among United States troops between 1941 and 1945 have put the subject on a scientific footing. In the brain minimal changes were noted: occasional scattered petechiæ throughout the grey and

white matter, with some perivascular lymphocytic infiltration. Microscopic examination of the spinal leptomeninges showed some non-specific hyperplasia. In a minority of cases the anterior horn cells in the spinal cord were affected by some chromatolysis. The most significant histological findings were in the peripheral nerves. Here there was severe œdema, with demyelinization and phagocytic infiltration. Proliferation of the Schwann cells was also noted; older pathologists have inaccurately styled this "schwannitis" as the basic lesion. The maximal changes were noted at the point of junction of the anterior and posterior nerve roots. It is to be presumed that the clinical pattern of events takes its origin according to whether the pathological changes described spread more into the anterior than the posterior roots or *vice versa*.

Treatment.

There is no specific cure, although it will now be interesting to find if aureomycin or "Chloromycetin", of proved effectiveness against some viral infections, will in any way alter the clinical course of infective polyneuritis. Treatment is mostly supportive and preventive. In the presence of bulbar symptoms nasal feeding is necessary; the function of the respiratory muscles must be carefully watched, and the patient should be nursed in an institution possessing a mechanical respirator. It is wise to employ penicillin prophylactically in view of the recognized danger of aspiration pneumonia. Paralysed muscles are splinted, and the advice of physiotherapists should be sought in the convalescent phase. Blaffner *et alii* (1947) have claimed early recovery of paralysed muscular function after administration of neostigmine methyl sulphate (1:2000) subcutaneously.

Diagnosis.

Differentiation from anterior poliomyelitis is important, particularly when the latter is in epidemic form. In infective polyneuritis the muscular paralysis is usually symmetrical and peripheral, and at least some degree of sensory loss is discoverable. Moreover, the findings of cerebro-spinal fluid studies are entirely different in the two diseases.

Cases of the Guillain-Barré syndrome must be differentiated from other types of polyneuritis. In particular the diphtheritic form may cause some confusion, since albumino-cytological dissociation is a finding common to both clinical conditions; in the taking of the history careful note must be made of the occurrence of membranous tonsillitis or wound infection. An adequate history is also likely to indicate whether alcohol, avitaminosis *B*, lead, diabetes *et cetera* are implicated. Sarcoidosis and *periarteritis nodosa* must be excluded in obscure cases. Recently a form of polyneuritis has been associated with bronchogenic carcinoma (Wyburn Mason, 1948; Lennox, 1950), which suggests that the lungs in all obscure cases of polyneuritis should be submitted to X-ray examination as a routine.

In transverse myelitis reflex bladder dysfunction and segmental anæsthesia are prominent findings, and the plantar reflexes are extensor in type; confusion with the Guillain-Barré syndrome is unlikely unless the latter is met with in a bizarre form.

"Landry's paralysis" has always been a thorn in the side of systematic neurologists (see Kinnier Wilson, 1941). It would appear that this form of ascending paralysis is but a syndrome occurring in a variety of pathological conditions and is not a nosological entity. Infective polyneuritis is but one cause; but Landry's paralysis also complicates measles and rubella, as well as porphyria.

Ætiology.

In recent years it has been assumed that infective polyneuritis is of viral origin, and consideration of the natural history of the disease would certainly support this contention. But virological studies have given consistently negative results, and although it is attractive to consider the neurotropic propensities of the viruses causing infective hepatitis, infectious mononucleosis *et cetera* in relationship to the Guillain-Barré syndrome, such discussion is profitless in the absence of any concrete evidence.

Reports of Cases.

The three cases presented below were encountered within three months at Roebourne, a small isolated township on the north-west coast of Australia, about 950 miles from Perth. All the patients were full-blooded aboriginal natives. History-taking in these persons is, at the best of times, unsatisfactory; never is it so difficult as when attempts are made to assess with accuracy subjective sensory symptoms.

CASE I.—A male patient, aged about twenty years, lives at a native reserve camp a mile away from the town. At the beginning of March, 1950, he was treated for "coryzal" symptoms by the matron at the local hospital. A week later he reported again, complaining of weakness of the legs and arms, and it was noted that he was grossly ataxic when he attempted to walk. He was flown to hospital at Port Hedland, where he remained under observation for five weeks. The only other significant information obtained from him on admission to hospital was that his arms and legs felt numb and that he occasionally felt lancinating pains in his left arm. There was no history suggestive of recent diphtheritic infection.

Examination showed him to be a tall boy, underweight for his height. His temperature on admission to hospital was 100° F.; his pulse rate was 105 per minute. His pyrexia subsided in two days, but the tachycardia remained for a week. No infection of the throat was present, and examination of the lungs showed no abnormal physical signs. There was a faint apical systolic bruit which was considered of no importance, and the cardio-vascular system was considered quite normal.

Examination of the central nervous system revealed that the pupils were regular and equal, with normal reflex action. The optic fundi were normal in appearance. There was no nystagmus, or weakness of the extraocular muscles. Symmetrical weakness of the face was noticed, of the lower motor neuron type; other cranial nerves were normal.

Peripheral cutaneous sensory loss of the "glove and stocking" type was present. Total anæsthesia for pain and temperature was recorded in the legs symmetrically to the level of the junction of the lower and middle thirds of the thigh, and in the arms, to the elbows. In each extremity a zone of relative hypoæsthesia existed to a level of about five centimetres above the area of anæsthesia. Vibration sense was lost at the extremities. Posterior root involvement was also indicated by the presence of gross ataxia; Rombergism was one of the last neurological signs to disappear after the patient was ambulant.

Muscular paralysis of the groups below the knee and below the elbow joints was severe. Both flexors and extensors were equally affected. Gross weakness without wasting was present. Weakness to a lesser degree of the trunk muscles was present. All tendon reflexes were absent. The plantar responses were not at first elicited, but latterly were flexor.

The condition followed a benign and uncomplicated course. Malnutrition, with clinical avitaminosis B_1, was at first diagnosed, but as the patient failed to respond quickly to large intravenous doses of aneurin, a diagnosis of the Guillain-Barré syndrome was considered, and a report on the cerebro-spinal fluid, obtained one week after the onset of paralysis, seemed to confirm this; there was no increase in the number of cells, but the protein concentration was 124 milligrammes per 100 millilitres. The Pandy test produced a positive result, and the Wassermann test a negative result. A white blood cell count at this stage showed the cells to number 5400 per cubic millimetre. The differential white count showed the following proportions: polymorphonuclear cells 72%, eosinophile cells 1%, lymphocytes 21%, monocytes 6%.

The patient began to make a slow but uninterrupted recovery after the decline of the pyrexia on the third day after his admission to hospital. At no stage did he suffer from any respiratory embarrassment. After two weeks sensory loss was confined to absent vibration sense. He was able to walk three and a half weeks after the onset of paralysis, and he was discharged from hospital after five weeks.

This patient, with typical albumino-cytological dissociation, had extensive sensory loss involving all categories, and generalized motor paralysis including the facial nerves.

CASE II.—A female patient, aged about twenty-two years, a sister of the patient in Case I, resided at the same camp. She was treated as an out-patient at Roebourne hospital for a mild upper respiratory infection in July. Five days later she was carried in with extreme weakness of the legs, trunk and arms, and was flown immediately to Port Hedland, where for a few days she was the cause of some anxiety, for the nearest Drinker apparatus is 1000 miles away. A detailed history was not obtained.

Examination of the patient showed a strong facial resemblance to her brother, and she had the same asthenic body configuration. She was apyrexial on her admission to hospital and remained so throughout her illness. There were no abnormal physical signs in the lungs; the cardio-vascular system was clinically normal.

Clinical examination of the central nervous system revealed severe generalized flaccid paralysis. The patient could barely exert any voluntary power in the extremities, and she could not raise her head from the pillow. The excursion of the lower ribs for the first few days after admission appeared diminished, but most mercifully she was spared complete respiratory paralysis. There was some equivocal neck stiffness during these first two days, but this passed off; Kernig's and Brudzinski's signs were absent. The tendon reflexes were all absent, and Babinski's sign was "negative" on both sides.

Examination of the upper cranial nerves showed no loss of function, but some fibrillatory twitching of the tongue muscles and slurring of speech indicated slight bulbar involvement. The facial nerves escaped.

Sensory loss was minimal. There was some hypoæsthesia for cutaneous sensation over both feet and ankles, and vibration sense was lost at the level of the malleoli.

Examination of cerebro-spinal fluid, obtained under normal pressure one week after the patient's admission to hospital, showed no increase in the number of cells, but a raised concentration of protein (98 milligrammes per 100 millilitres).

Recovery during the first fortnight was very slow. There was no obvious response to vitamin B_1 preparations. It was then decided to give the patient some anti-myasthenic preparation. The response to "Prostigmin" was immediate and clinically obvious. An injection of 0·05 milligramme of "Prostigmin" (Roche) was given intramuscularly every three hours. Within a day the patient could move her legs freely, and after a week she could walk. Thereafter, although "Prostigmin" was no longer administered, her condition slowly improved. She was discharged from hospital after eight weeks.

This was a relatively severe case of the Landry type, with severe motor paralysis, slight bulbar involvement and mild sensory loss.

CASE III.—A male patient, aged about thirty years, reported at Roebourne Hospital with a severe paroxysmal cough and elevated temperature. The pyrexia did not subside with treatment by penicillin and sulphonamide drugs. Approximately one week after the onset of respiratory symptoms, he complained of weakness in both legs and had to be supported when he walked. He was transferred by air to the native hospital at Port Hedland.

He was a strongly built aboriginal. His temperature on admission to hospital (eight days after the commencement of respiratory symptoms) was 101·2° F., and his pulse rate was 95 per minute. His respiration rate was 28 per minute. He had a harsh dry cough. Dulness to percussion was present at the lower lobe of the right lung, and auscultatory sounds of patchy consolidation and coarse crepitations were heard at the same area of the lungs. In view of the absence of response to treatment with antibiotics and sulphonamides, a tentative diagnosis of "atypical" viral pneumonia was made. A radiograph of the chest appeared to confirm this, for a diffuse and patchy opacity extending fanwise from the right hilum was noted.

The cardio-vascular system was normal.

Examination of the central nervous system revealed normal function of the cranial nerves. Loss of motor power was restricted to a moderate paralysis of the muscle groups below the knees. The knee jerks were elicited, but both ankle jerks were absent. Plantar responses were flexor. Cutaneous sensation below the knee was blunted, and vibration sense was absent. The motor and sensory functions of the trunk and upper extremities were normal, and the tendon reflexes were present and equal.

Penicillin and sulphamerazine were administered for a further two days after his admission to hospital (totals of 1·2 mega units and 28 grammes, respectively, were given). The temperature remained elevated, falling by lysis seven days after the patient's admission to hospital. He was treated symptomatically with "A.P.C." mixture and a cough linctus.

Two and a half weeks after his admission to hospital he was discharged, motor and sensory function having returned to normal, and the lung fields being radiographically clear.

The cerebro-spinal fluid was obtained under normal pressure on the first day of his admission to hospital. There was no increase in the number of cells, but the concentration of protein was 184 milligrammes per 100 millilitres.

This case shows a greater degree of albumino-cytological dissociation than the two previous cases. Neurological signs were strictly limited. It is probable that these were ætiologically related to the upper respiratory infection.

Discussion.

A few references have been made to the Guillain-Barré syndrome in Australasian literature (Hegarty, 1943; Susman and Maddox, 1940; Kennedy, 1944; Ryan, 1945) in the last decade, but there have not hitherto been any reports of its occurrence among aboriginal natives; indeed, epidemiological studies on aboriginal natives in this country are very scarce. These three cases are therefore of some interest, particularly since they exemplify the variety of clinical patterns encountered. That they were, in fact, cases of the Guillain-Barré syndrome cannot be doubted, for in each instance the polyneuritic symptoms failed to respond to vitamin B_1 therapy, and there was no evidence of diphtheritic infection or of any other possible cause of polyneuritis. It is possible that in Case III neurological symptoms complicated an infection of the virus of "atypical" pneumonia.

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Reports of Cases.

REPORT OF TWO CASES OF ECTOPIC PREGNANCY IN NEW GUINEA NATIVES.

By R. F. R. SCRAGG, M.B., B.S., D.T.M. and H.,
Kavieng, New Ireland.

THE following two patients with ectopic pregnancy were admitted to the Native Hospital, Kavieng, within ten days of each other.

Case I.

L., of Madang district, aged about thirty years, had two children, aged six and three years. She had had one miscarriage in the period between these two children. After the birth of the second child she was in hospital for a period with lower abdominal pain. She stated that she had never suffered from gonorrhœa.

When admitted to hospital on December 21, 1950, she stated that her last menstrual period had occurred six weeks before, and that two days before her admission vaginal hæmorrhage had started. This was followed soon after by severe lower abdominal pain. By the time she was examined, the abdominal pain was generalized and she had an aching pain in each shoulder.

On examination, the patient appeared apprehensive and her breathing was thoracic. Her conjunctivæ were pale. There was generalized abdominal tenderness. The abdomen was tense, but not rigid. At vaginal examination, the cervix and the slightly enlarged anteverted uterus were found to be pushed over to the right by a tender mass in the left fornix. Movement of the cervix caused severe pain.

At operation, curettage produced profuse decidual scrappings, but no chorionic material. There was much blood in the pelvic and peritoneal cavities. The outer third of the left Fallopian tube was replaced by a hæmorrhagic mass, about the size of an egg, with a tear one inch long in the upper surface oozing blood. The left fimbria appeared patent. The left ovary contained the *corpus luteum*. There were some firm adhesions in the pelvis, particularly in relation to the right Fallopian tube. Left salpingectomy and oophorectomy were performed. The mass in the left Fallopian tube consisted of hæmorrhagic chorionic villi, with no evidence of a fœtus or amniotic sac. Recovery was uneventful, except for some peritonitis, which responded to penicillin.

Case II.

E., of Kaselok village, New Ireland, aged about forty years, had children aged twenty, eighteen, fourteen and twelve years. She had had no miscarriages, but another of her children had died at the age of five years, eleven years earlier. After the birth of the last child she had had severe abdominal pain with scanty lochia. There was no history of gonorrhœa.

She was admitted to hospital on December 30, 1950. The history and results of examination were identical with those in Case I, except that the duration of symptoms was only twelve hours and shoulder ache was absent.

Curettage produced decidua-like scrapings, and at laparotomy there was a large amount of blood clot, mainly in the pelvis. There was a swelling in the centre of the left Fallopian tube, about two inches long and one inch in diameter, on the posterior surface. The end of the left tube and part of the broad ligament were adherent to the posterior pelvic peritoneum, and the tube and ovary were removed with difficulty. Elsewhere, there was also evidence of past pelvic peritonitis. The left ovary again contained the developing *corpus luteum*. The tubal swelling on incision was found to consist of chorionic villi and an intact amniotic sac containing an embryo about one centimetre long.

Comment.

Both patients had a possible history of previous pelvic and tubal inflammation, and this was probably a factor in the origin of the condition. The occurrence of this condition in natives is of interest, and more cases must no doubt occur among the many female natives who as yet die in their villages with their condition undiagnosed. It is hoped that more will present themselves for early treatment, as the natives come to realize the advantage of surgical treatment in abdominal pain.

Acknowledgement.

I wish to express my thanks to Dr. J. T. Gunther, the Director of Health for the Territory of Papua and New Guinea, for permission to publish these case histories.

THE ROLE OF INSTITUTIONALIZATION IN MENTAL ILLNESS.[1]

By S. BENEDEK,
Callan Park Mental Hospital, Sydney.

THE manifestations of mental illness are manifold and intricate, the most obvious being the conduct of the patient. The relatives and friends of the mentally ill may not notice his abnormal feelings and thoughts, but sooner or later they have to seek medical aid for his behaviour.

The therapeutic armamentarium, however valuable, is at times limited. The first line of defence is eugenics, the elimination of poor material. Our knowledge of eugenics, however, theoretical and applied, is still much open to debate. The second line of defence is mental hygiene, which for many reasons still cannot be applied universally. The third line of defence is an important one, and this is the general practitioner, whose early detection of the affection, reassurance, reorientation of the patient and psychosomatic approach may hinder or prevent the "accumulation of faulty habits of reaction" or other psychotic or psychoneurotic trends. The fourth and valuable line of defence is the specialist "outside", who uses all available methods to keep the patient out of mental hospital or to keep his voluntary status through admission to voluntary hospitals. The fifth line of defence of the patient and of society is the mental hospital, and frequently this is unavoidable. The last line of defence, after all available methods have been exhausted, outside or within the mental hospital, is the long-range adaptation of the patient to the life in an institution, that is, institutionalization. This is admittedly neither a spectacular nor always a happy solution, but in a number of cases it is the only one left.

In this hospital, as in any other, we all feel privileged to learn and apply an old or new treatment or some better management to help the patient to go back to the outside world. We all feel happier to be able to discharge a patient than to keep him in an institution, but for those who "just cannot take it", or whom on account of their conduct the outside world cannot accommodate, the only chance to live in a community is life in an institution.

The following few cases illustrate that life in an institution may contribute to the contentment of the patient.

CASE I.—Mrs. E.G., aged ninety-one years, has been in this hospital for just over forty-one years. On her admission she was depressed and disorientated. During the course of years she lost her depression and became a good wardworker, quiet if left to herself, but aggressive and resentful if interfered with in any way. She is always dressed in a most eccentric fashion, sometimes many years ahead of her time. So the years pass on; she lives a happy institution life and she could not live outside.

[1] Based on a demonstration of cases and comments at a meeting of the Section of Neurology, Psychiatry and Neurosurgery of the New South Wales Branch of the British Medical Association on October 5, 1950.

CASE II.—Mr. H.B., aged fifty-four years, broke down after the first World War. He was first treated as a voluntary patient for some years and was finally certified. At that stage he was catatonic, manneristic and hallucinated, and had ideas of persecution. In 1926 he became mute, and after seventeen years of mutism, in 1943, after the introduction of electroconvulsive therapy, he started to talk. He retained his mannerisms and some of his strange delusions about mindreaders. He goes out twice a week on daily leave. He regards himself as a guest here and accepts the attendants as his guardians, but he could not and does not want to settle outside.

CASE III.—Mr. H.S., aged fifty-eight years, was certified insane in 1924, as he became a public nuisance by his various methods of protection from his enemies, who persecuted him in different ways, including "doping" him on trams by injecting some poison with a syringe. His delusions have not changed much. As soon as he is out of the hospital "they" are after him. In the hospital he is "all right". He works in the garden and takes pride in his flowers. He is cooperative and genuinely happy.

CASE IV.—Mr. V.K.K., aged fifty-one years, spent over fifteen years in Callan Park. On his admission he was aggressive and excited, and claimed to have supernatural powers. He was continually "picking up wireless messages" in the airing court. He was very difficult to manage, and by somebody's bright idea he was given a few square yards of rocky ground adjoining the refractory ward. He proved himself a mechanical and inventive genius. He constructed an irrigation system from scrap metals with rather inadequate tools. This little garden is his creation and domain, and he will not allow anybody to work with him. He is busily occupied and happy. Any attempt to transfer him into a convalescent ward results in speedy deterioration of his conduct.

CASE V.—Mr. C.J.W., aged fifty-four years, was admitted to the hospital thirteen years ago. Before his admission he found life so miserable that he went out to Maroubra a few times to throw himself over the cliffs, but he said: "I was too much of a coward even for that." His depression subsided after a couple of years; he was tried out on leave, but after a day or two he became confused, morose and hallucinated. Now he works in the garden, and at times he informs the medical officer that he is Mandrake, the magician. He has no wish to leave the hospital, which is the only place where he feels secure and contented.

Discussion.

These few cases demonstrate that institutionalization has its place in the care of the mentally ill. During the last century institutional care changed more in form than in principle, and this unspectacular but none the less important part of mental hospital work proved its value in appropriate cases.

One may speculate whether at some future date the rationale of the satisfying results of the support and protection of institutional care will be explained in neurophysiological terms.

Perhaps the stability of the hospital, where most of the unpredictable stimuli of the external world are excluded, enables the patient to utilize some negative "feedback" instead of the disturbing reverberating circuit of the idea of a threatening or changed reality.

Reviews.

THE CHEMOTHERAPY OF MALARIA.

IN the third edition of "Recent Advances in Chemotherapy" Dr. G. M. Findlay has the difficult task of dealing comprehensively with the phoenix-like rise of his subject over the past ten years.[1] On account of the enormous mass of material which has accumulated since the previous single volume edition in 1939, it has been necessary to divide the new edition into four volumes. The first of these, which appeared last year, dealt very satisfactorily with the chemotherapy of ectoparasites, helminth infections, amœbiasis, trypanosomiasis, leishmaniasis and other protozoal infections. The second volume is entirely devoted to the chemotherapy of malaria.

The intensive investigations into malarial therapy that were undertaken during and since the second World War are indicated by the wealth of new information in this volume. In the 1939 edition of the book only 48 pages were allotted to the chemotherapy of malaria, while the present edition contains nearly 600 pages on this. Some 87 pages are given entirely to the listing of references, which shows the bulk of the recent literature on the subject. This aspect of his laborious task of authorship is referred to by Dr. Findlay in his prefatory comment: "of the 2000 reputable medical journals now published only those devoted to the more esoteric forms of psychiatry can be disregarded as unlikely to contain papers of chemotherapeutic importance".

The volume commences with a consideration of the biology of malaria in relation to chemotherapy, followed by a detailed account of the chemistry of compounds with regard to their antimalarial activity. Chapters are devoted to the pharmacology of the antimalarial drugs and to their toxic reactions, and a long section, occupying over one-quarter of the volume, is given to the chemotherapeutic treatment of malarial infections. Further compendious chapters deal with drug resistance in plasmodia, immunity and chemotherapy, the treatment of human malarial infections, and the mode of action of antimalarial drugs.

This is an excellent work, which presents its packed information, fully documented, in a useful form. It is indispensable to workers in this field.

[1] "Recent Advances in Chemotherapy", by G. M. Findlay, C.B.E., Sc.D., M.D., F.R.C.P.; Third Edition; Volume II; 1951. London: J. and A. Churchill, Limited. 8" × 5¼", pp. 597. Price: 36s.

THE BEGINNINGS OF ENGLISH PUBLIC HEALTH.

SHORTLY after the first world war, Sir George Newman, one of the greatest in a long line of public health reformers in England, wrote these words: "Public expenditure on national health is like expenditure on a life-boat or a fire-engine; even more, it is like a long-term investment. It yields its interest with absolute certainty, a thousand-fold, but only in the course of years and sometimes in the course of generations. It is money hidden in maternity, in good schools, in pure foods, in clean streets, in sanitary houses, in an abundant water supply, in dispensaries, hospitals and sanatoria, and in a vast network of a sanitary and protective cordon in every village and city of the land. Its efforts are unappreciated until they are withdrawn. Yet without this investment the nation is bankrupt."

Since this concise statement of the position appeared in the annual report of the Chief Medical Officer to the British Ministry of Health for 1921, further progress has been made by the Government in raising the general social standards of the people, and the public health authorities have continued to keep abreast of the latest scientific knowledge in order to show figures pointing to higher health standards in their annual reports. But the complex system of public and personal health services mentioned by Newman has been built up over the last hundred years by dint of self-sacrificing efforts and sheer determination on the part of a few enlightened statesmen, medical practitioners and public-spirited citizens.

The complete narrative of the development of these services in England and Wales has been admirably presented by Dr. W. M. Frazer, Professor of Public Health in the University of Liverpool, in a substantial volume, "A History of English Public Health: 1834-1939", and no medical library can afford to be without it.[1] Even the illustrations have a moving story to tell. One plate shows a slum court typical of those found in many large cities during the period of rapid industrial expansion, while beneath it is the refreshing view of a modern housing centre with airy buildings and open spaces around it. In another picture a striking contrast is revealed in the general appearance of children at a poor class school at the beginning of the present century and children forming a similar group at the same school today.

A third plate illustrates the difference in cabin accommodation provided for the crew of cargo ships over the same period. It is indeed strange that such conditions were tolerated within comparatively recent times, and that such

[1] "A History of English Public Health, 1834-1939", by W. M. Frazer, O.B.E., M.D., M.Sc., D.P.H.; 1950. London: Baillière, Tindall and Cox. 9¼" × 6¼", pp. 518, with 16 plates. Price: 35s.

radical and widespread changes for the better have been possible in our own generation.

The book is constructed on a sound chronological plan, with an introductory chapter tracing the history of public health and social legislation prior to the period under review. There are five major sections dealing separately with early experiments in sanitary legislation and organization, the rise and development of environmental hygiene, the personal health services in two parts from 1900 to 1929, and finally a review of the industrial, economic and social changes which demanded a modern outlook for the advancement of public health and social medicine.

Every aspect of the subject seems to have been adequately and carefully covered in this excellent book; it is fully documented, and written in an attractive and elegant style, as befits the recording of such a momentous development in the life of a great nation.

HISTORY OF THE INDIAN MEDICAL SERVICE.

"SURGEONS TWOE AND A BARBER" is the title given by Lieutenant-Colonel Donald McDonald to his book which has been written to record the activities of the medical profession in British India, from the founding of the East India Company in 1600 to the final disbanding of the Indian Medical Service in 1947.[1] Dr. McDonald has compiled a history of personalities and events based largely upon the researches of D. G. Crawford, who laboriously gathered together all the threads of factual knowledge bearing on the subject and published his material in 1914. Medical historians are always under a debt to such patient investigators, who slavishly keep on digging for facts, however irrelevant, insignificant or unromantic they may appear on the first analysis. The printed record derived from these time-absorbing labours seldom achieves popularity; but such records are frequently indispensable to the creative writer of history, who knows only too well that he must employ an attractive method of presentation before he can hope to interest his readers.

Much credit is due to Dr. McDonald for bringing the record of the Indian Medical Service right up to the end of the British Raj, and for his praiseworthy effort in seeking to give a rendering of the narrative in such a way as to encourage a more popular appeal. But the reader's concentration of thought is to some extent disturbed by frequent jolts in chronological sequence, lengthy quotations and constant interruptions in the continuity of the narrative; and many will feel some disappointment in the scant references to the important work of Peter Freyer, Ronald Ross, Leonard Rogers and Robert McCarrison—names which have given lustre to the service of which they were distinguished members.

Sir Bennett Hance has written a foreword and two prominent officers of the service have contributed interesting articles on certain aspects of medical research and public health. The book is further enhanced by many good portraits.

X-RAY DIAGNOSIS.

THE second volume of the second edition of "A Text-Book of X-Ray Diagnosis by British Authors", edited by S. Cochrane Shanks and Peter Kerley, has been received from the publishers, H. K. Lewis and Company, Limited, of London.[2] This particular volume deals with the cardio-vascular and respiratory systems.

The section on cardio-vascular disease deals exhaustively with all types of heart disease and describes the modern methods of investigation. The authors stress the importance of careful fluoroscopy which gives the observer an immediate knowledge of the size of the heart, the heart's action, and also the condition of the neighbouring viscera. It is also possible to examine the patient in various positions. Normal and abnormal pulsations may be noted. Angiocardiography has proved of great value in these investigations. This method of examination is essentially one for the specialist in specially equipped departments where rapid exposures and speedy film changers are available. Twenty-five to fifty millilitres of a 70% solution of diodone are used and 25 millilitres are injected per second. The exposures are made rapidly (12 millilitres in ten seconds). Some workers take films at the rate of four per second. Kymography has a very limited field; it is useful in the differentiation of tumours and aneurysms, but does not allow of differentiation between acquired and transmitted pulsations.

The normal and abnormal conditions of the heart and vessels are well illustrated. The appearances of valvular disease and congenital abnormalities receive special attention.

The section on respiratory conditions occupies most of the book. The normal appearances are described and various pitfalls in diagnosis are considered.

In the section on technique the authors stress the importance of rapid exposures with the rotating target tube.

The section on anatomy is most interesting, and useful illustrations are reproduced in which a chart of the bronchial tree is superimposed on the radiograph of the chest.

The authors advise caution in interpreting "increased markings" as being due to bronchitis. A very complete survey of the pneumonias is included. In regard to silicosis a pre-silicotic stage is described. This is purely clinical and cannot be interpreted from the radiograph. The illustrations of silicosis in its various stages are very good.

The section on tuberculosis follows conventional lines.

The normal appearances of the mediastinum are described briefly and illustrated well, and the technique of examination in various planes is detailed. This is followed by a discussion of the various mediastinal tumours.

Pulmonary neoplasms receive extensive attention and the illustrations are good. These neoplasms are very difficult to distinguish from one another and the diagnosis can be made only after operation or at post-mortem examination.

There is an extensive bibliography at the end of the book.

This volume maintains the high standard set by Volumes III and IV, which have already been received.

SAVILL'S SYSTEM OF CLINICAL MEDICINE.

"SAVILL'S SYSTEM OF CLINICAL MEDICINE" is now appearing in its thirteenth edition, revised and edited by E. C. Warner.[1] In this rather extensive rewriting the editor has been assisted by a panel of 18 well-qualified contributors. Dr. T. D. Savill produced the first edition over forty years ago, and the general form of the book now is apparently very similar to that of the original edition.

Dr. Savill conceived the idea of writing a text-book of medicine starting from the clinical features presented by patients, rather than by assuming the diagnosis, as is done in most text-books of medicine. The arrangement of the text is based primarily on the leading symptoms of which patients may complain. Each chapter is divided into three parts. Part A deals with symptoms which may indicate the part of the body affected, fallacies incidental to their detection, and a brief account of the various causes. Part B treats physical signs associated with the particular organ or site of the body. Part C considers the clinical classification of the various diseases affecting the area, together with a discussion of the various aspects of the diseases, including the prognosis and treatment.

As a result of this arrangement the chapters as such deal not only with the major systems but also with such subjects as the facies, the urine, pyrexia, and general debility.

Many clinicians are personally interested in this method of presentation of medicine, as it is essentially practical. Students of medicine tend to learn diseases as such from text-books and are unable to attach the appropriate disease to a particular patient in differential diagnosis. This book

[1] "Surgeons Twoe and A Barber: Being Some Account of the Life and Work of the Indian Medical Service (1600-1947)", by Donald McDonald, with a foreword by Lieutenant-General Sir Bennett Hance, K.C.I.E., O.B.E., K.H.S., I.M.S.; 1950. London: William Heinemann (Medical Books), Limited. 9¼" × 7¼", pp. 324, with many illustrations. Price: 42s.

[2] "A Text-Book of X-Ray Diagnosis by British Authors", in four volumes, edited by S. Cochrane Shanks, M.D., F.R.C.P., F.F.R., and Peter Kerley, M.D., F.R.C.P., F.F.R., D.M.R.E.; Second Edition, Volume II; 1951. London: H. K. Lewis and Company, Limited. 9¼" × 6¼", pp. 716, with 605 illustrations. Price: 65s.

[1] "Savill's System of Clinical Medicine: Dealing with the Diagnosis, Prognosis, and Treatment of Disease for Students and Practitioners", edited by E. C. Warner, M.D., F.R.C.P.; Thirteenth Edition; 1950. London: Edward Arnold and Company. 8¼" × 5¼", pp. 1232, with many illustrations. Price: 35s.

is designed to overcome this difficulty, and to describe medicine as it is seen at the bedside, the main basis always remaining the patient's leading symptom.

This method of presentation is naturally rather complicated, and gives rise to many headings, sub-headings and cross-references. In this manner the subject matter is accurately set out, with a very good index to provide for rapid reference use. The text contains many diagrams and tables which make understanding easier. The less common and less important sections are usefully placed in small type.

Of criticism there is some. The system of headings, sub-headings and cross-references is so complicated in places that it is difficult to follow. It is therefore not a book that can be read page after page in order; a considerable amount of thumbing of the pages is required. This disadvantage is of course inherent in this type of presentation. Secondly, in common with most comprehensive books on medicine, some of the subject matter is not strictly modern. Particularly in regard to treatment, the student would be well advised to use other books for the discussion of details of treatment.

As a text-book for students and post-graduates it is not considered that this book should replace text-books of medicine written in the more conventional manner. However, it should provide a very useful reference book for the clinical student when studying particular patients in the ward. In this regard it should be preferable to the more usually consulted books on differential diagnosis. Dr. Warner is to be congratulated on the production of a book which fulfils its purpose in such an admirable way, and it is to be hoped that it finds its way on to the shelves of every medical library and the desk of many medical students and practitioners.

Notes on Books, Current Journals and New Appliances.

CALCULATED DATA ON NUTRITION AND CHEMICAL GROWTH IN CHILDHOOD.

IN the third volume of "Nutrition and Chemical Growth in Childhood", Icie G. Macy has presented some of the data calculated in connexion with a major study in child nutrition and growth. Volumes I and II, which have appeared previously, were concerned respectively with evaluation (the methods and techniques used in the studies, together with average data for children) and with original data (the actual facts and figures gathered in the studies). The present volume contains those calculated data which seemed to "represent the broadest areas of possible use and interest". The data apply to each of the original subjects studied and cover intake, absorption and retention of the main food elements and the proximal composition and energy values of each diet. An appendix contains an interpretation of the skiagrams of each child's hand published in a previous volume, with a statement of the skeletal ages of bones of each hand and wrist. A cumulative index covers all three volumes.

A JOURNAL OF ANTIBIOTICS AND CHEMOTHERAPY.

THE first number (April, 1951) of a new monthly journal entitled *Antibiotics and Chemotherapy* has been received. It is described as a journal of experimental and clinical studies on antibiotics, hormones and chemotherapeutics. The publishers are the Washington Institute of Medicine. The editor-in-chief is Henry Welch, director of the division of antibiotics of the Food and Drug Administration at Washington, supported by an international medical board of twenty members including such well-known persons as Sir Alexander Fleming, Sir Howard Florey, Chester S. Keefer, E. C. Kendall, E. J. Pulaski, S. A. Waksman and B. Zondek. Others of good standing in the related fields have contributed papers which either appear in the first number of *Antibiotics and Chemotherapy* or have been accepted for publication in subsequent issues. The first three of the 15 articles in the first number are a brief statement on antibiotics by S. A. Waksman, an assessment of the present status of antibiotic therapy by H. F. Dowling and a description of the development of cortisone as a therapeutic agent by E. C. Kendall. Other articles deal with the treatment of scrub typhus, yaws, tropical ulcer and Carrion's disease, new antibiotics (fumagillin and rhodomycin), various experimental aspects of antibiotics, and a preliminary report on intravenous chloramphenicol therapy. Appropriate abstracts from international medical literature and book reviews complete the number, which is sound and attractive in its printing and general production. The journal should be useful, and because of its subject matter should justify its addition to the ranks of medical journals, overwhelming as their number already is. The annual subscription rate is $10.00 for both domestic and foreign subscriptions.

[1] "Nutrition and Chemical Growth in Childhood", Volume III, Calculated Data, by Icie G. Macy, Ph.D., Sc.D., with a foreword by Helen A. Hunscher, Ph.D.; 1951. Springfield, Illinois: Charles C. Thomas. 9" x 6", pp. 728. Price: $2.00.

Books Received.

[The mention of a book in this column does not imply that no review will appear in a subsequent issue.]

"Biological Actions of the Adenine Nucleotides", by H. N. Green, M.A., M.D., M.Sc., and H. B. Stoner, M.D., B.Sc., with a foreword by Sir Edward Mellanby, G.B.E., K.C.B., F.R.S., M.D., Sc.D., F.R.C.P.; 1950. London: H. K. Lewis and Company, Limited. 8½" x 5½", pp. 238, with 65 illustrations. Price: 25s.

Deals with the mechanism of the production of shock.

"Patterns of Disease on a Basis of Physiologic Pathology", by Frank L. Apperly, M.A., M.D. (Oxford), D.Sc. (Melbourne), F.R.C.P. (London); 1951. Philadelphia: J. B. Lippincott Company. Sydney: Angus and Robertson, Limited. 9" x 6", pp. 470, with 50 figures and 37 charts. Price: 86s.

In dealing with a disease, the author deals with the beginning of a disease process, and does not start with the end result; he is also concerned with the compensatory mechanisms adopted by the body.

"Current Therapy in 1951: Latest Approved Methods of Treatment for the Practising Physician", edited by Howard F. Conn, M.D.; 1951. Philadelphia and London: W. B. Saunders Company. Melbourne: W. Ramsay (Surgical) Proprietary, Limited. 11" x 8", pp. 730. Price: £4 15s.

The book is divided into fifteen sections, devoted to different systems or groups of conditions. There are 275 contributors.

"The Medical Clinics of North America" (issued every two months); 1951. Philadelphia and London: W. B. Saunders Company. Melbourne: W. Ramsay (Surgical) Proprietary, Limited. Chicago Number. 9" x 6", pp. 304, with 46 figures. Price: £7 5s. *per annum* (cloth binding) and £6 *per annum* (paper binding).

The book is devoted to a symposium on clinical advances in medicine. The twenty articles are the work of 34 contributors.

"The Surgical Clinics of North America"; 1951. Philadelphia and London: W. B. Saunders Company. Melbourne: W. Ramsay (Surgical) Proprietary, Limited. Chicago Number. 9" x 6", pp. 320, with 105 illustrations. Price: £7 5s. *per annum* (cloth binding) and £6 *per annum* (paper binding).

Consists of a symposium on gastro-œsophageal surgery. There are 18 articles and 29 contributors.

"Immunology", by Noble Pierce Sherwood, Ph.D., M.D., F.A.C.P.; Third Edition; 1951. St. Louis: The C. V. Mosby Company. Melbourne: W. Ramsay (Surgical) Proprietary, Limited. 8½" x 5½", pp. 732, with 7 plates in colour and 21 figures. Price: 84s.

Intended for the use of medical students.

"The Eye Manifestations of Internal Diseases (Medical Ophthalmology)", by I. S. Tassman, M.D.; 1951. St. Louis: The C. V. Mosby Company. Melbourne: W. Ramsay (Surgical) Proprietary, Limited. 9½" x 6½", pp. 672, with 279 illustrations, including 25 in colour. Price: £6 6s.

An attempt to provide a bridge between the eye manifestations and the other medical aspects of internal disease.

The Medical Journal of Australia

SATURDAY, JULY 14, 1951.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

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THE SERPENT OF ÆSCULAPIUS.

THE serpent has long been accepted as the symbol of medicine and has been incorporated into many badges, crests and emblems of the medical profession. This association is usually regarded as dating from the time of Æsculapius, a Greek physician who was deified, but who was indeed, according to so eminent an authority as Charles Singer,[1] an historic personage. Existing statues of Æsculapius (he should perhaps be called by his Greek name Asklepios, but the Latin Æsculapius is more generally used) show him with a rather massive stick around which is coiled a serpent; examples are in the Capitoline Museum in Rome (this is reproduced in Singer's book) and in the British Museum (this is reproduced in a recent article by H. St. H. Vertue[2]). Temples were founded in honour of Æsculapius, the most notable being that at Epidaurus, and to these the afflicted came for healing. The temple at Epidaurus seems to have been a place of great beauty, and this propitious atmosphere with the faith of the patients undoubtedly wrought cures. However, the Greek tradition which has influenced modern medicine more than that of Æsculapius is that of Hippocrates of Cos and the famous school with which he was associated. It is interesting to find therefore that the serpent of Æsculapius has retained its place, except in the few instances in which (whether deliberately or not it is hard to determine) the caduceus of Hermes has been incorporated into medical emblems. The caduceus, as it is represented today, has two snakes coiled about a rod, but originally, according to Vertue, it had only two ribbons; the tops of these ribbons presumably, as they were borne along by the messenger of the gods, flew in the breeze and came eventually to be regarded as snakes' heads. There may be arguments to support the use of this emblem, but it is embarrassing to try to reconcile medicine with "the god who leads the dead below".

The history of the serpent before the day of Æsculapius is obscure, though many facts and stories are known that can be woven into different patterns. The brazen serpent set up by Moses in the wilderness for healing is well known, and Israel later gave it idolatrous worship. Snake-worship was known also among the Egyptians, and among the Minoans, who inhabited the Mediterranean coasts up to about 1000 B.C., before the Greek invaders, Dorians and Ionians, overran them from the north. Vertue has traced the serpent back from Æsculapius through Greek myth to the people who knew the Ægean shores before the Greeks. Mythology is a curious compound of history, allegory and fancy, so that to draw conclusions from it may be quite valid. Some will undoubtedly disagree with Vertue's interpretation of the myths he recounts, but his views are nevertheless of interest and worthy of attention. He tells the old tales in some little detail, but reference to the main points is sufficient here to show his train of thought. He finds the beginning of the story in the ancient contest for supremacy between Athena, a serpent-goddess, and Poseidon, a horse-god. Athena, who became one of the most important of the Greek goddesses and was endowed by the Greeks with many of her finest qualities, was apparently inherited by them from the Ægean people; her name, Vertue states, is a survival from their tongue and is not Greek. She was chaste, fearless, wise and industrious, as well as tall and splendidly handsome. Her worship was early associated with that of the serpent, and a series of contests for supremacy that she had with Poseidon, who was associated with the horse, had the character of contests between the wise serpent and the physically more spectacular but less intelligent horse. "The contest between the two", according to Vertue, "is everlasting, and the issue varies as the higher moral and intellectual faculties are exalted or brought down." In a contest for supremacy in Attica, Athena won and Poseidon retired to the sea. Cecrops, first king of Attica, partly man and partly serpent, learnt wisdom from her and in her honour founded the city of Athens. Later kings also were associated with her and with the serpent. The worship of the serpent appears to have been pre-Greek and had as a feature the provision of a human bride for the serpent. The bride was supposed to be impregnated by the serpent, but in fact this office was performed by a priest-king. Vertue suggests that in the ritual subconsciously the serpent represents the phallus, which represents the father, who in his turn is no true father but a phantasma, first formed in the mind during childhood and not fully admitted to consciousness. The worship of the serpent's spouse represents the phantasma of the mother. The serpent was invested with the characters of wealth, wisdom, power and productiveness that belong to the father. A notable contrast is drawn by Vertue between such savage rites as those associated with Bacchus and the worship of the serpent, who represented the father as wise and benignant, and of his bride, who was a goddess not of Nature but of man's mind. As civilization progressed, the taste for animal-worship declined, and the serpent's attributes began to be transferred to his spouse, who at length became a maiden. "Thus arose the sublime Athena, the aspiration and the satisfaction of that wonderful hybrid people the Athenians, perhaps the most brilliant and the most gifted race that the world has known." Athena had a bird, Corone, who had been a beautiful maiden; Athena had changed her into a crow to save her from the amorous attentions of

[1] "A Short History of Medicine", 1928.
[2] *Guy's Hospital Reports*, Volume XCIX, Numbers 2 and 3, 1950.

Poseidon, and she becomes important to the story. The other important character is Apollo, essentially a Greek god, whose worship was set up by Dorian invaders at Delphi. Before his arrival this was a shrine of worship of the serpent, who through the priests provided wise answers to those who sought them. Apollo overthrew the serpent and took over the oracular function which became famous as the Delphic oracle of Apollo. Art, music and athletics came to be associated with this temple and its lovely environs, and here was practised "a religion of great splendour and beauty". Apollo, who is known as the father of medicine, acquired qualities of great nobility and physical and mental attractiveness, and though he was fond of a beautiful woman he was unstained by cruelty or vice. In places the worship of Apollo was blended with that of the serpent, and "Apollo, whose beauty was his own, usurped some of the sagacity of the serpent as well". Then came the episode of the beautiful Coronis, the crow-maiden, who "pleased the Delphian Apollo". Believing her unfaithful, the god slew her, only in great remorse to draw from her womb as she died a living child, his own. This was Æsculapius, the future god of medicine. Vertue asserts that in this story the crow-maiden represents Athena herself, so that "the ancestry of the god of Medicine, now that we know it, must give us pause". In the eyes of the Greeks, he was the offspring of the two most virtuous, intellectual and beautiful deities that were known. He inherited the snake from Athena, and to a small extent perhaps from Apollo; but, Vertue points out, "we may recognize as well what a handsome compliment it is to Medicine that it has been considered worthy to receive this venerable emblem of benign wisdom and power". Vertue rather extols the desirable qualities of the temple of Æsculapius and Epidaurus and the approach to medicine practised there, particularly in the light of modern knowledge of the effect of mind on body; and he laments that medicine today shows no sign of return to the Æsculapian conception. Others, of course, have contrasted the medicine of the Æsculapian temples with that of the Hippocratic school, to the great disadvantage of the former. Some have refused to believe that the temple practice made any contribution of value at all to Greek medicine, though Singer concedes that some Greek physicians practised magic and not all the priests were charlatans. It would, however, be a grave error to reject Vertue's plea. There is much to be gained from respecting and emulating the Athenian way of life, and a passion for scientific rationalism can frighten away from medicine much that belongs to the nobler, subtler practice of her art. Beauty has too seldom been a primary or even a secondary consideration in, for example, the designing of hospitals. The liberality of thought so characteristic of Athens tends more and more to be crowded out of our specialized educational curricula. Even a civilized Poseidon is arising, Vertue suggests, the issue of whose activity will be not Athenian, but Spartan; for in Sparta "individuality was merged in the service of the state, a way of life inimical to medicine, which is personal and individual like the other arts", and Sparta's contribution to art, science, religion and philosophy was none. We do not wish to return to superstition, but there is food for thought in Vertue's claim that we are the rightful heirs of Epidaurus and the disciples of Athena and the serpent.

Current Comment.

APLASTIC ANÆMIA.

APLASTIC ANÆMIA was described over sixty years ago, and within less than ten years of Ehrlich's original account cases of this condition had been correctly ascribed to benzol. More recently radioactive substances, gold and organic arsenicals have attracted even more attention as potential causes, and the list of drugs which have been incriminated is still growing. But notwithstanding the greater awareness of physicians and hæmatologists of the toxic effects of many substances on the bone marrow, there remains a considerable unexplained residue of anæmias which are progressive and usually associated with diminution of the numbers of leucocytes and platelets, and which show no evidence of increased blood destruction. The lack of response of these anæmias to ordinary therapeutic measures is also a characteristic which might almost be called pathognomonic, and it seems justifiable to include in the aplastic group those which have been specially named "refractory". This is pointed out by T. H. Boon and J. N. Walton in a clinical and hæmatological study on aplastic anæmia.[1] After discussing the chief features of the disease, they describe in detail the results of therapy. This study emphasizes that aplastic anæmia of the so-called idiopathic type is by no means a disease of the young, as the higher age groups are also affected, though in them the disease tends to be chronic. They have given prominence too to the importance of hæmorrhages as part of the clinical picture, and their potential dangers. The common course of the disease as a progressive anæmia may be misleading, and the occurrence of infective or hæmorrhagic episodes may deflect attention from the underlying pathology, as some of the authors' cases show. They recommend that diagnosis should rest upon examination of both the blood and the bone marrow, and that the latter tissue be derived from the iliac crest by surgical biopsy, as a single specimen obtained by aspiration may be misleading because it comes from an island of marrow in the sternum not representative of the true condition. The results of treatment are, of course, of great importance. It is known that the prospect is much better in aplastic anæmia due to toxic substances, for the removal of the malign influence on the blood-forming organ may be early enough to permit the precursor cells to grow and mature. When the cause is unknown, however, the outlook is much worse, and the disease or one of its complications usually proves fatal. Not even the most recent and potent drugs appear to be of any use, and the one mainstay is blood transfusion. In passing it may be noted that severe anæmia may occur from the too frequent giving of blood as a professional donor, and though this should not occur, it is of interest, for it does not itself require transfusion if it is to be cured; it is not due to arrest of the power to form or to mature red cells but to depletion of stores of iron. The administration of iron is alone sufficient to bring about restoration of a normal blood picture, as Jeanne C. Bateman has recently pointed out.[2]

Returning to the treatment of aplastic anæmia by blood transfusion, Boon and Walton emphasize that the problem of management of the patient is real and difficult, involving factors other than the mere technical giving of blood and taking precautions against those reactions which may occur after repeated transfusion. They present a series of 25 patients, eighteen of whom had no apparent or discovered cause for their illness. In 16 cases the blood was macrocytic; the marrow was hyperplastic in five cases, hypoplastic in nine, and completely aplastic in nine. Six patients of this series have apparently made a complete recovery; of these three suffered from the idiopathic type of disease. Complications included reactions, and the authors found that it was desirable to send blood to a regional transfusion laboratory for full investigation. Undue circulatory dangers were avoided in patients with

[1] *The Quarterly Journal of Medicine*, January, 1951.
[2] *Annals of Internal Medicine*, February, 1951.

low hæmoglobin levels by the slow giving of packed red cells. Fresh blood was found rather more effective than bank blood in the control of bleeding. The use of a polythene catheter was found of value, especially for restless and nervous patients, as it allowed free movement of the limb and was sometimes introduced through a transfusion needle which was then removed. But in spite of all care, the repetition of transfusion over a long period of time was an ordeal to both patient and doctor; after several months both dreaded the procedure, and emotional reactions, at least on the part of the patient, were not uncommon. One important factor was, in the authors' experience, the maintenance of personal relations by the medical staff, so that the same doctor always attended the patient. Certainly some fortitude is necessary in repeated treatments of this kind, but the cured patients would count it worth all the trial and effort. The successful outcome of this work should be a stimulus to others.

In conclusion it may be remarked that in some experimental work on the panmyelopathy of cats produced by urethane, S. Moeschlin and A. Bodmer have recently found[1] that if the dosage is too great for spontaneous recovery to take place, repair of the damage to the marrow cannot be made by the giving of growth substances such as folic acid or vitamin B_6. This would seem to support the view that as yet we have no drug which can reverse these changes; it is not impossible that more experimental work on the effects of blood transfusion on the damaged marrow may be illuminating.

GENETICS AND MEDICAL PRACTICE.

A REMARKABLE change has come over the face of medicine since the days when Osler named pneumonia as the "Captain of the Men of Death", and opened his text-book with a long and detailed account of typhoid fever. Today the infectious and contagious diseases have been very largely subdued, and this, as James V. Neel[2] has pointed out, has resulted in an increasing direction of medical attention towards conditions variously and overlappingly termed constitutional, endocrine, metabolic or congenital. In such conditions, he states, heredity is frequently an important factor, and a knowledge of its principles is helpful. Further, there nowadays arise in medicine situations in which the physician's answer to his patient can and should be based on knowledge of the simple laws of heredity. During the past nine years the University of Michigan has maintained an heredity clinic, one of whose functions has been to explore the legitimate applications of the laws of heredity to the practice of medicine, and Neel illustrates a discussion of this question with accounts of typical problems drawn from the experience of that clinic. He opens his paper with a simple, informative account of the principles of genetics. Most of this material will be familiar to informed medical practitioners, but it will help anyone seeking to learn the elements of the subject. Neel then goes on to deal with seven specific medical problems in which principles of genetics are involved, and in most cases states some useful generalizations centred around the specific problem. The first problem relates to the possibility of developing and of transmitting to children Huntington's chorea, which is similar in this respect to a number of inherited ophthalmological, neurological, neuromuscular and other disorders of late onset, including certain types of cataract, *retinitis pigmentosa*, otosclerosis and certain of the muscular dystrophies and atrophies. These have been shown to be inherited as if due to a single dominant gene. The probability that a child will develop the disease if one parent is affected is one in two, and if he does a further one in two that any child of his will also be affected. The same one in two probability also applies to the chance of transmission of a dominantly inherited abnormality present at birth. The problem of probability of inheritance associated with a single recessive gene is illustrated by infantile amaurotic idiocy, and Neel shows how this probability may be assessed for parents who already have an affected child, for siblings of such parents whose own infant children are as yet normal, and for siblings who have no children yet. Similar principles will apply for albinism, cystic fibrosis of the pancreas, hepato-lenticular degeneration, certain types of mental deficiency and various ophthalmological abnormalities. Neel illustrates with a case of *retinitis pigmentosa* the problem of assessing the probable course of an inherited disease, and points out that the most accurate prognosis may often be derived from a knowledge of the behaviour of the disease in other members of the family, with significant differences between various families readily apparent. In general, he states, where a disease may be inherited in several different ways the recessively inherited form is usually more severe in its manifestations than the dominantly inherited form. On the subject of mental defect two questions are raised—the probability that the next child will be affected and the validity of therapeutic abortion. Neel states that there can be no doubt that a large proportion of mental defect is endogenous and inherited; his subsequent discussion leaves the impression that the particular case requires judgement on its own merits. He is cautious on the subject of therapeutic abortion. He refers to rubella and the lack of reliable figures on which to base a conclusion, but considers that the chances of an abnormal outcome following rubella early in pregnancy are probably as great as or greater than when dominant heredity is involved. Following on the point that rubella is now recognized by some authorities as grounds for abortion, he suggests that when plainly inherited disease is present in a family and "the prospective parents of a defective child" voluntarily request abortion or sterilization, "society faces a responsibility which has perhaps not yet been squarely met". Neel then refers to the question of the probability of recurrence of a given congenital malformation once a child with that malformation has been born into a family. He points out that certain congenital malformations have a simple genetic basis, but most seem to have a more complex ætiology, the importance of genetic factors varying from one family to the next. There is evidence that when a child has been born with a congenital malformation sufficiently severe to result in its being listed on the death certificate as the primary or secondary cause of death, the chances are in the neighbourhood of one in eight of the occurrence of another malformation in any subsequent pregnancy. Neel lists the following figures for the probability in five common malformations, both parents being normal: hare-lip and cleft palate, 44:1000; clubfoot, 30:1000; anencephaly and *spina bifida*, 20:1000; mongolism, 30-40:1000. He warns, however, that these figures must be used cautiously. He goes on to make passing reference to the place of genetics in determining a child's parentage and concludes with a mention of mutations and their resultant new genes, which may be either dominant or recessive. He quotes as an example the appearance of retinoblastoma in a family, the tendency to which is due to a single dominant gene that arises once in about every 50,000 germ cells as a result of mutation. Three possibilities are listed to be remembered when an apparently isolated instance of certain congenital abnormalities or degenerative diseases is encountered in a family: first, that it is due to factors operative in the uterine or post-uterine environment of the individual and not likely to be repeated within the family; second, that it is due to the homozygous state for some particular recessive gene; third, that it is the result of a dominant mutation. At present our knowledge does not make it possible to go beyond stating these possibilities in many cases. Over all, however, available knowledge of heredity will answer many problems and dispel misconceptions, which in certain instances are, as Neel states, serious psychological hazards. We may well support his contention that, increasingly, the geneticist should be regarded as a member of a research team, bringing to the problem of the ætiology of a particular disease a set of analytical methods which are of greatest value when combined with the approach of the physiologist, the biochemist and the clinician.

[1] *Blood*, March, 1951.
[2] *Medical Clinics of North America*, March, 1951.

Abstracts from Medical Literature.

SURGERY.

Exfoliative Cytological Diagnosis.

DESMOND MAGNER (*The Canadian Medical Association Journal*, August, 1950) discusses exfoliative cytological diagnosis, and states that cytological techniques have been used in the diagnosis of cancer of the female genital tract, the lung, the stomach, the urinary tract, the prostate, the peritoneum and the pleura. The degree of accuracy varies, depending on the site of the cancer, but in general it is fairly high. This renders it necessary to consider cytological techniques as extremely valuable diagnostic aids. However, the occurrence of "false negative" and "false positive" cytological findings, even under the best circumstances, indicates that cytological diagnosis should not replace tissue biopsy. Cytological techniques could be used as screening tests for cancer of the female genital tract, the lung and the urinary tract; but such services would have to be maintained *in perpetuo*, and thus involve frequent reexamination of all patients, to be of lasting value. This procedure is not recommended, in so far as it involves a large number of trained personnel, high cost and a relatively low yield of symptomless cases of cancer.

Thyreo-Glossal Duct Cysts.

N. E. NACHLAS (*Annals of Otology, Rhinology and Laryngology*, June, 1950) has studied 128 patients with thyreo-glossal cysts admitted over a period of twelve years to the Massachusetts Eye and Ear Infirmary. These cysts have their origin from remnants of the thyreo-glossal duct. The most usual location is in the mid-line between the hyoid bone and thyreoid notch. Sometimes there may be a discharging opening at the *foramen caecum* on the base of the tongue, or a bulging may develop at this location. The main complaint is of a swelling, usually recurrent. Infection was present in 66% of cases. The usual history was of upper respiratory tract infection followed by a mid-line tumour. Surgical excision is advisable. First it is necessary to ascertain the presence of the thyreoid gland in its normal position. Infection should be overcome, if necessary aided by incision. Excision is made via a transverse cervical incision at the level of the thyreoid notch. The cyst and duct are difficult to follow; therefore a core of tissue in the mid-line and about one-eighth of an inch to each side is taken out upwards and backwards by the *foramen caecum*. It is usually necessary to include the central portion of the hyoid bone in the core of tissue.

Temporary Plombage before Thoracoplasty.

F. M. WOODS *et alii* (*Diseases of the Chest*, November, 1950) have devised an operation to permit the performance of thoracoplasty for pulmonary tuberculosis in no more than two stages. At the first stage the periosteum is stripped from all the ribs destined for removal in the projected thoracoplasty, but the ribs are not removed. Plombage is now carried out by the introduction of plastic balls between the denuded ribs on the outside and the rib beds on the inside. Thus the latter are held in a "stove-in" position and the underlying lung in a collapsed state. The incompressibility of the balls and the rigidity of the ribs prevent any paradoxical motion of the chest wall. The muscles of the chest wall and the skin are sewn up. An interval of time is allowed to elapse during which fibrosis and bone regeneration from the periosteum produce sufficient rigidity to prevent paradoxical motion. The second stage of the operation is then performed, the denuded ribs and the plastic balls being removed. The operation has been found safe and effective even in elderly patients and in those with extensive tuberculosis.

Surgical Wounds of the Lung.

C. W. FINDLAY (*The Journal of Thoracic Surgery*, November, 1950) has shown in the experimental animal that a precise anatomical resection of a pulmonary lobar segment causes a wound in the lung that heals ideally. A mature surface scar develops over the course of four weeks with minimal distortion of the parenchyma. If lung tissue of the remaining segment is damaged during operative dissection or if "sutures are taken" local fibrosis and distortion result. Occlusion of the bronchus or pulmonary artery to the wounded segment also alters healing. Following resection of an anatomical segment of a lobe it is unnecessary and probably unwise to "pleuralize" the surface of the lung wound. It is suggested that segmental lobar resection in humans be abandoned for an alternative procedure if the operator cannot dissect easily in the intersegmental plane. The author believes that many post-operative complications of segmental excision are probably related to undue trauma and residual disease at the time of resection.

Aortic Stenosis Surgically Relieved.

C. P. BAILEY *et alii* (*The Journal of Thoracic Surgery*, October, 1950) have successfully operated upon ten patients with aortic stenosis by incising the right common carotid artery in the neck and passing down the lumen of the vessel an instrument for dilating the aortic valve. In a third patient a false passage was produced with fatal results. The authors review many experiments made in order to devise a safe technique for this operation.

Mignon's Eosinophilic Granuloma.

H. N. HADDERS, R. RUDING AND D. VERVAT (*Archivum Chirurgicum Neerlandicum*, Volume II, Fasciculus 4, 1950) discuss the clinical, radiological and pathological findings of eosinophilic granuloma with reference to the literature and some personal cases. They state that this is a focal affection of the skeleton, which may occur solitarily or in multiple form. It is most frequent in children under the age of five years and less frequent between the ages of five and thirty-five years. The skull is the most frequent site, but it has occurred in the lower jaw, ribs, femurs, vertebræ and pelvis. Pain is a common symptom, although it may be absent. Pathological fracture is not uncommon. Cranial foci may cause headache, visual complaints, exophthalmos, paralysis of the facial nerve or irritation of the labyrinth. Diagnosis on X-ray findings alone is not possible, the X-ray appearances being variable. Sharply circumscribed, smooth, cyst-like clearances may be found next to foci, over which the cortex is eroded and swollen, with a pronounced periosteal reaction. As the X-ray appearances of the affection are very similar to those of osteogenic sarcoma or Ewing's tumour, careful diagnosis is imperative. This is possible only by pathological examination. In this manner, other affections, except Hand-Schüller-Christian disease and Letterer-Siwe's disease, may be eliminated. Histological examination reveals reticular cells, eosinophile leucocytes, multinuclear giant cells, macrophages, small hæmorrhages and, in some cases, Charcot-Leyden crystals. Surgical and radiological treatment are recommended. Prognosis should be made with restriction because of the close association with Hand-Schüller-Christian disease and Letterer-Siwe's syndrome.

Pedicle Graft for Ulcers of the Lower Extremities.

R. BRUMMELKAMP (*Archivum Chirurgicum Neerlandicum*, Volume II, Fasciculus 4, 1950) recommends the use of a cross-leg pedicle graft for the treatment of chronic leg ulcers. The graft is taken with subcutaneous fat from the calf of the sound leg. Instead of using plaster of Paris or adhesive strapping to fix the legs in juxtaposition for three weeks, the author has made a wooden frame within which the legs are enclosed. The donor leg, the lower one, is supported on a Cramer splint, while the recipient leg is suspended from the upper part of the frame by means of two Kirschner wires and stirrups through the proximal and distal parts of the tibia. The author has treated five patients in this manner.

Use of Homografts in Extensively Burned Patients.

GEORGE BENTON SANDERS AND ROY HENRY MOORE, JUNIOR (*The American Journal of Surgery*, November 15, 1950), summarize the following data concerning the transplant of skin from one individual to another. Skin homografts will take approximately as well as autografts transplanted under equal physiological conditions. The take is probably not influenced by disparity in race, sex or blood group. There are no skin groups analogous to blood groups. After taking, homografts survive for varying periods of from three to ten weeks, but, for a time at least, proliferate epithelium and grow briefly. Ultimately, homografts melt away and disappear completely, the sole exception being in the case of identical twins, in which skin homografts may persist indefinitely. Skin homografts, as well as autografts, may be stored under sterile conditions of refrigeration for a period up to three weeks with apparently no diminution in the incidence of "takes". Because of an immune reaction which is provoked, repeated homografts from the same donor are useless, but homografts from fresh donors will take almost as well as at the initial skin

grafting. It is now well established that the intelligent use of homografts as a physiological skin dressing can be life-saving or of inestimable value in expediting healing and recovery in severely burned patients. At the present time homografts are used to provide temporary skin coverage when autogenous skin is not available because of the extent of the burn, when, although autogenous skin is available, the patient is too ill to stand a formal grafting procedure, and to stimulate the patient's healing and reparative processes in cases in which autogenous grafting has consistently failed. The authors present the case notes of two patients to illustrate these points. One patient, a girl of seventeen years, suffered burns involving 87% of her body surface and was discharged from hospital after four months with practically complete healing. The other, a thirteen-year-old boy, with a 60% body surface burn, nearly half of which was full thickness in depth, was able to return to school about four months after the accident. The grafts were taken from many donors after selection to exclude syphilis, malaria and infectious hepatitis and were cut under local infiltration anæsthesia.

Surgical Repair of Mitral Insufficiency.

C. P. BAILEY *et alii* (*Diseases of the Chest*, February, 1951) describe the development of an operation for the repair of the incompetent mitral valve with a strip of pericardium fashioned into a pedicled graft, the normal nerve and blood supply at the base of the graft being preserved. If mitral stenosis is present, commissurotomy is performed first. The graft is threaded through small incisions in the left ventricle and brought into position on the ventricular side of the valve, close to it and somewhat lax. The operation has been performed in seven cases. In six it was considered to be successful in that the regurgitation of blood through the valve was diminished by at least 75%. In three cases the leak was considered to be completely controlled. In the unsuccessful case it was thought that the graft was improperly placed.

Prophylaxis of Tetanus with Penicillin-Procaine.

WELTON I. TAYLOR AND MILAN NOVAK (*Annals of Surgery*, January, 1951) state that clinical tetanus is a serious disease with a high mortality. Fatal termination occurs in 40% to 80% of cases in spite of the use of antitoxin and modern therapeutic aids. Recent emphasis has been put on more extensive use of prophylactic measures because of the failure of therapy in the fully developed case. Immunization with toxoid, practised widely on service personnel during World War II, has proved relatively effective in preventing development of symptoms. However, comparatively few in the general population of today are protected, and the majority of people are susceptible to tetanus. A recent analysis of 56 cases of tetanus showed that 80% of them had developed after relatively minor injuries or superficial cuts, instances which would hardly warrant the use of prophylactic antitetanus serum. A further disturbing fact is that the disease may develop in spite of routine protective treatment with antitoxin. *Clostridium tetani* is sensitive to penicillin *in vivo* and *in vitro*, and the development of penicillin-procaine has made possible the maintenance of therapeutic levels for several days after single injection of 300,000 to 600,000 units. The authors conducted a series of experiments on mice and determined that the prophylaxis of tetanus by means of the local administration of procaine-penicillin G under these experimental conditions was far more effective than prophylaxis with antitoxin. The inability of antitoxin to cope with a maximal infection indicates the practical value of penicillin as a prophylactic agent in tetanus, either to supplement the prophylactic dose of antitoxin or to be used in its stead in cases in which it is desirable to prevent sensitization of the patient to horse serum. The results shown here bear out the wisdom of removing the source of toxin with penicillin rather than depending entirely on antitoxin to neutralize the toxin without attempting to stop its further production. Validity of penicillin-procaine prophylaxis in human beings will have to await a statistical evaluation after adequate clinical trial.

Resection of the Auricular Appendages.

W. P. LONGMIRE *et alii* (*Diseases of the Chest*, March, 1951) describe the resection of the auricular appendages of the heart for recurrent embolism in three persons with persistent auricular fibrillation due to rheumatic heart disease. Mural thrombi were demonstrated in each case. Cardiac function was not apparently influenced by the operation, and the electrocardiograms were not altered. No further embolism occurred afterwards, the follow-up periods being from five to ten months.

Thoracic Reconstruction with Tantalum Mesh Gauze.

A. E. W. ADA AND E. P. HEVENOR (*The Journal of Thoracic Surgery*, February, 1951) review the literature relating to methods of reconstructing the thoracic wall. They also present a method of repairing defects of the thoracic wall with tantalum mesh gauze.

Surgical Correction of a Double Aortic Arch.

W. F. BUGDEN (*The Journal of Thoracic Surgery*, December, 1950) presents a case of double aortic arch, which produced symptoms of tracheal constriction, correctly diagnosed and successfully treated by division of one of the arches. An X-ray examination with an opaque bolus showed a narrowing of the œsophagus at the level of the aortic arch. Bronchoscopy revealed the antero-posterior narrowing of the trachea.

Sympathectomy in Arteriosclerotic Peripheral Vascular Disease.

MICHAEL E. DE BAKEY, OSCAR CREECH AND JEROME P. WOODHALL (*The Journal of the American Medical Association*, December 9, 1950) present an evaluation of the results of lumbar sympathectomy in the treatment of arteriosclerotic peripheral vascular disease based on a study of 146 consecutive patients, 55 of whom had bilateral involvement. All the patients were followed up at least six months, 75% for more than one year and 38% for from two to four or more years. The results of treatment were evaluated at the end of the follow-up period. The best results were achieved in patients with the least severe disease; over 85% showed improvement. A satisfactory improvement was observed among more than three-fourths of the patients with impending gangrene, and even among the patients with frank gangrene improvement with salvage of the extremity was secured in 35% of cases. No essential difference was noted among the diabetic and non-diabetic patients, except that there was a higher incidence of improvement in the diabetics with gangrene. No operative deaths occurred in the series. Sympathetic block is not regarded as a dependable test as a preliminary procedure to operation, except perhaps in cases of severe intractable pain or ischæmic neuritis. The authors state that sympathectomy is the method of choice in the treatment of arteriosclerotic peripheral vascular disease unless there exist definite contra-indications to operation, such as severe cardiac, cerebral, renal or pulmonary involvement, a far advanced and rapidly progressive process, and pronounced atrophic changes in the extremity.

Results of Operation (Splanchnicotomy) for Hypertension.

ANDERS WESTERBORN (*Acta medica Scandinavica, Supplementum* CCXLVI) presents a follow-up study of 47 patients operated upon for hypertension (thoraco-lumbar splanchnicotomy). One patient died at operation, two died later from intercurrent diseases, and eight died from conditions associated with hypertension. Thirty-two patients who survived the operation for more than one year were investigated, particularly in regard to symptoms, working ability and blood pressure. Of these, 23 were symptom-free or had experienced great improvement and were in no way disabled; five had received considerable benefit and were to a certain extent able to support themselves; four had experienced no improvement. Only five patients had a normal blood pressure one to six years after the operation. A reduction of the systolic pressure by 40 millimetres of mercury and more occurred in 16 cases, a reduction of 20 to 35 millimetres was evident in eight cases, and there was little or no change in the blood pressure in the remaining eight cases. In 21 cases there was a reduction of 20 millimetres or more in the diastolic pressure. The mean systolic and diastolic blood pressure reductions in the 32 cases were 43 millimetres and 25 millimetres respectively. Nine patients had had malignant hypertension; of these seven were dead, and the remainder had little or no benefit from the operation. The author states that the analysis of the series is an argument against surgical treatment of patients suffering from malignant hypertension. On the other hand, surgery is indicated in essential hypertension because the results are good. The author agrees with the American surgeons who claim operation to be the best treatment available for patients with essential hypertension.

British Medical Association News.

THE AUSTRALIAN ASSOCIATION OF PHYSICAL MEDICINE (BRITISH MEDICAL ASSOCIATION).

THE annual meeting of the Australian Association of Physical Medicine (British Medical Association) will be held at Brisbane on July 25, 26 and 27, 1951. The programme is as follows:

Wednesday, July 25.

10 a.m.—Dr. H. Crawford: "The Link up between Orthopædic Surgery and Physical Medicine", Physiotherapy Department, Medical School, Herston Road, Brisbane.

11 a.m.—Dr. F. Wilkie Smith: "Sinusitis and Cervical Disk Lesions", Physiotherapy Department.

2.30 p.m.—Dr. Gordon Rich: "A Review of Some Interesting Cases", Physiotherapy Department.

8 p.m.—Dr. L. Parr: "Rheumatoid Arthritis", Physiotherapy Department.

Thursday, July 26.

10 a.m.—Dr. B. G. Wade: "Ultra-Sonic Treatment", Physiotherapy Department, Medical School. Discussion to be opened by Professor Webster and Mr. Robinson.

11 a.m.—Dr. L. Parr: "The Possible Role of the Thymus Gland in Rheumatoid Arthritis", Physiotherapy Department.

8.15 p.m.—Dr. J. Shanasy: Clinical meeting—demonstration of cases, 149 Wickham Terrace, Brisbane.

Friday, July 27.

10 a.m.—Dr. L. Wedlick: "Recent Results of Treatment with Cortisone and ACTH", Physiotherapy Department, Medical School.

8.15 p.m.—Annual meeting and presidential address, United Services Club.

Out of the Past.

In this column will be published from time to time extracts, taken from medical journals, newspapers, official and historical records, diaries and so on, dealing with events connected with the early medical history of Australia.

CHIEF SURGEON WHITE TO MR. SKILL (BANKS PAPERS).[1]

[Historical Records of New South Wales.]

Sydney Cove,
Port Jackson,
New South Wales,
April 17, 1790.

[EXTRACT.]

Dear Sir:

. . . . .

When the Supply arrived with the melancholy tidings[2] the Governor called all the officers together to consult and deliberate on what was best to be done in our present distracted and deplorable situation. He laid before us the state of the provision store, which contained only four months flour and three of pork at half allowance, which has been our station for some time past, every other species of provision being long since expended. We, therefore, determined on the necessity of reducing our half allowance of these two articles to such a proportion as will enable us to drag out a miserable existence for seven months. Should we have no arrivals in that time the game will be up with us, for all the grain of every kind which we have been able to raise in two years and three months, would not support us for three weeks, which is a very good instance of the ingratitude and extreme poverty of the soil and country at large though great exertions have been made. Much cannot now be done, limited in food and reduced as the people are, who have not had one ounce of fresh animal food since first in the country: a country and place so forbidding, and so hateful as only to merit execration and curses, for it has been a source of expence to the mother country and of evil and misfortune to us, without there ever being the smallest likelihood of its repaying or recompencing either. From what we have already seen we may conclude that there is not a single article in the whole country that in the nature of things could prove of the smallest use or advantage to the mother country or the commercial world. In the name of heaven what has the Ministry been about? Surely they have quite forgotten or neglected us, otherwise they would have sent to see what has become of us, and to know how we were likely to succeed. However, they must soon know from the heavy bills that will be presented to them, and the misfortunes and losses which have already happened to us, how necessary it becomes to relinquish a scheme that in the nature of things can never answer. How a business of this kind (the expence of which must be great) could first be thought of without sending to examine the country as was Captain Thompson's errand to the coast of Africa is to every person here a matter of great surprise. Mons Payrouse and Clavard the French circumnavigators, as well as us, have been very much surprised at Mr. Cook's description of Botany Bay: the wood is bad, the soil light, poor, and sandy, nor has it anything to recommend it. Accurate observers have surveyed the country without being able to see anything like the meadowland that Mr. Cook and others mention: the Frenchmen declare the same, and that in the whole course of their voyage they never saw a place half so unpromising for a settlement as this. Before they came to Botany Bay they had been at Norfolk Island, but could neither anchor nor land: they made an observation with regard to it (which from its singularity, propriety, and force I cannot suppress) that it was only a place fit for angels and eagles to reside in.

The Supply, tender, sails tomorrow for Batavia in hopes the Dutch may be able to send in time to save us. Should any accident happen to her Lord have mercy on us.

. . . . .

Whatever may be my fate and that of my fellow sufferers, God bless you all in England, prays your faithful and sincere &c.

JOHN WHITE.

[1] By courtesy of the Mitchell Library, Sydney.
[2] Of the loss of the *Sirius* at Norfolk Island.

Correspondence.

PRESCRIBING UNDER THE PHARMACEUTICAL BENEFITS ACT.

SIR: In the course of the day's work I wished to prescribe a product which possibly came under the *Pharmaceutical Benefits Act*. It was necessary to consult both the list of drugs issued by the Commonwealth Department of Health, dated September, 1950, also the "Complete Revised List" reprinted from *The Australasian Journal of Pharmacy* by Wilke and Company, of Melbourne, marked as "Effective from March 1, 1951".

While I was doing this, my patient remarked: "You are as bad as the solicitors—looking up everything in books."

I ask you, sir—whither are we going?

Yours, etc.,
E. H. WHITE.

Hamilton,
New South Wales,
June 22, 1951.

PAS AND POTASSIUM DEPLETION.

SIR: While not denying the possible importance of liquorice and impurities in causing potassium depletion as a result of PAS administration, we wish to indicate that we have experimental evidence that sodium PAS ("Paramisan"—Herts), in common with other salicylates, has a stimulating effect on the pituitary-adrenal system in the rat (Hetzel and Hine, 1951). The preparation used did not contain liquorice as it was put up for injection, although it obviously contained some impurity.

It would appear, therefore, that the salicylate radical is probably at least partly responsible for the depletion of potassium produced by large doses of PAS, by virtue of its effect on the pituitary-adrenal system.

Yours, etc.,
BASIL S. HETZEL, M.D.
DENISE C. HINE, B.Sc.
The Institute of Medical and Veterinary Science,
Frome Road,
Adelaide.
June 20, 1951.

Reference.

Hetzel, B S., and Hine, D. C. (1951), *The Lancet*, in the press.

Obituary.

JOHN FLYNN.

WE are indebted to Dr. George Simpson for the following account of the career of the late Very Reverend John Flynn.

Few lay persons have, in modern times, exerted such a profound influence on medical services as did the Very Reverend John Flynn, O.B.E., D.D., who died in Sydney on May 5, 1951. Owing to his vision, personal efforts and inspiration the whole aspect of medicine in the inland of Australia has been altered and a medical service developed in these isolated regions, comprising two-thirds of the area of Australia, which is comparable with that available in settled areas.

Flynn's Flying Doctor scheme with its pedal radio and aeroplanes has made a doctor as readily available for advice or treatment to the most distant settler or traveller as he is to a suburban resident. The service has attracted world-wide interest and has received much publicity in Australia and overseas.

"Flynn of the Inland" by Ion Idriess and "Flying Doctor Calling" by Ernestine Hill, of which *The Times Literary Supplement* says "The bare truth of this astonishing story far surpasses in human interest the sensation of the film world", describe the development of the service and what has been achieved.

From time to time articles have appeared in official medical journals which show the medical profession has readily acknowledged the importance of John Flynn's contribution to medical progress.

The *British Medical Journal* in its review of "Fifty Years of Medicine", January 7, 1950, published a short summary under the appropriate heading "From Kittyhawk to Cloncurry".

The Commonwealth Jubilee Number of THE MEDICAL JOURNAL OF AUSTRALIA, January 6, 1951, contains a special article, "Medicine in the Inland", which pays due tribute to John Flynn for his pioneering work, on which the effective inland medical services are now based.

"Australian Aerial Medical Services" was the subject of a paper read by Dr. Allan Vickers (one of the doctors associated as Flying Doctor with the development of the service) at the annual meeting of the British Medical Association held at Melbourne in 1935. On this occasion John Flynn was honoured by being made an honorary member of the association. The Flying Doctor Service was one of the subjects presented at the second British Commonwealth Medical Conference in Brisbane in May, 1950. John Flynn was an honoured guest, spoke at the meeting and met delegates. In 1929 John Flynn was a delegate to the first World Conference on Aviation Medicine held in Paris.

John Flynn was born on November 25, 1880, at Moliagul, a small town in central Victoria, already famous for the discovery there of the "Welcome Stranger" gold nugget. His father, Thomas Flynn, was a school teacher and the family doctor was Dr. John A. Sutherland, father of Dr. B. Milne Sutherland, of Melbourne. Dr. Sutherland recalls that Mr. Flynn said that John was the one in the family he was worried about. He did not know what to make of him—if anything. He was educated at the local State School and at the Melbourne University High School, and at the age of eighteen entered his father's profession, and for four years taught at Beech Forest in the Otway Ranges and Buchan in Gippsland.

It is generally accepted that his ideas regarding the medical services for isolated regions which he developed, were conceived during camel journals in the inland after his appointment as Superintendent of the Australian Inland Mission, but the origin of his ideas goes back much further. While at Beech Forest he had occasion to take a badly injured man to Colac for medical attention, and Dr. Hope, who was the doctor consulted, recalled how John Flynn, exhausted with the journey and anxiety regarding his patient, asked if he could lie down in the surgery to rest. It is likely that then there first came to him the realization of all that skilled medical care meant to those living in isolation. From then on his interest in first aid and medical matters became intense.

In 1902 he became a home missionary of the Presbyterian Church and commenced studies for the ministry at Ormond College, Melbourne. While conducting a mission to shearers at stations in the Western District he made his first contribution to medicine.

He found he could always get a hearing at a shearing shed if he made first aid the subject. In the study of the Reverend J. Andrew Barber, Minister of Hamilton Presbyterian Church, who was later to be very closely associated with the development of the Flying Doctor scheme, he prepared a remarkable little book, the "Bushman's Companion"—"a handful of hints for outbackers". Commencing with a most comprehensive and understandable first-aid manual, this publication contained in subsequent chapters—"Directions for Making a Will", "A Ramble Among Ideals", "Selected Scripture Readings", "Hymns", "Prayers", "A Form of Church Service", "Service for Burial of the Dead", "Postal Information", a calendar, and useful information of various sorts.

The introduction to "First Aid Hints" shows an appreciation of the proper position of "first-aiders" in relation to the medical profession:

> Further, while every thoughtful man will strive to render assistance in emergency, he will insist on qualified medical attendance at the earliest possible moment. Some unfortunates, on finding that an amateur can relieve them, are ready to trust him with their very lives. This is very flattering indeed, but—beware! Your scant smattering of knowledge of the real state of affairs will, if you are true, compel you to obtain immediate expert treatment.

It is remarkable that Beech Forest, where in 1910 that other great nursing service, the Victorian Bush Nursing Association of Sir James Barrett, was begun, should have also been the early inspiration of the nursing services of the Australian Inland Mission and of the Flying Doctor Service.

John Flynn completed his studies for the ministry, was ordained in Adelaide in 1911, and was appointed to the "Smith of Dunesk" mission in the outback of South Australia. Vast as was the territory of the parish of the "Smith of Dunesk" as measured in terms of settled areas, John Flynn knew it was but a corner of the inland—all sparsely settled country, lonely, isolated, the regions beyond, the "never never", a neglected land, a land of great need.

He had his mind made up before he entered on his mission that "Smith of Dunesk" was not enough. Here he saw only illustrations of the greater need of the bigger area.

He obtained permission from his superiors to make an initial survey covering the whole of the Northern Territory, right across the continent to Darwin. What he saw confirmed his belief and gave him facts to prove his case. Again it was the medical needs of the pioneers that impressed him. He saw the need for medical outposts, nursing homes for the present, as he realized there would not be sufficient work to keep a doctor occupied, with transport conditions as they were. He saw how the Church could reach the people in the form of practical Christianity—a mantle of safety, making home life possible where never before. He had already sown seeds in the minds of those who could help his cause—the brethren of the General Assembly of the Presbyterian Church of Australia which was to meet at the end of 1912.

John Flynn had ready his report based on practical experience and dramatically illustrating the need, and his proposal for the formation of the Australian Inland Mission to take over all the "regions beyond" from the States received immediate and enthusiastic support—an Australia-wide movement, a contribution by all States to the welfare of Australia, a mission of nomadic padres and established nursing homes to be healing, social and church centres in the inland.

There were many men of vision in the assembly, foremost of whom was the Reverend D. A. Cameron, Convenor of the Home Mission Committee in Victoria. They had the wisdom and courage to back this newcomer and his schemes. There were also those who were only too willing to dump on the new organization regions they could not manage and were not interested in. John Flynn was able to use, to further his scheme, both those who were with him and those who were indifferent. He was a statesman, but also a master political strategist.

He saw the need, he got the idea, he saw who could implement the idea, he interested them and proved the idea to them, he saw that they did the rest. That has ever been his method, and the reason for his great achievements is that he inspired others to do the work.

With the Australian Inland Mission an established fact, John Flynn set out on his life's work "to battle for a brighter bush". From then on he had no home or manse. He, like so many of the inlanders he served, was continually on the move. He was equally at home and known in any capital city or anywhere in the bush. In Melbourne he would be found at the Commercial Travellers' Club, in Sydney at the Hotel Metropole, or in general in any city where he was likely easiest to rub up against those "contacts" who were so necessary to further his project and whose interest would help provide finance.

In the inland he was to be found camped uncomfortably in a sandhill or in a dry river bed or at a lonely homestead or inland centre, as he went his way investigating problems small and great and working out solutions.

He was not a good camper, he was not an early riser; he really preferred the comfort of cities—within twenty miles of the General Post Office. In his camp gear he always included toilet rolls, enough spare parts for his car to often break it down by sheer weight, and when it was developed, a portable wireless transceiver.

The first nursing home at Oodnadatta had already been established, on faith, by the Smith of Dunesk Mission. This was the pattern of Australian Inland Mission homes soon to be established at inland centres until there was one within 100 miles of every settler.

There was much travelling and organizing for John Flynn in those first few years. He had to raise funds for his enterprise, but he never let that get him down. He had infinite faith in people providing what would be needed if the case for the need was properly put to them. He took great pains to put his case. He was a pioneer in visual educational methods. He prepared maps and graphs which illustrated his points and made a lasting impression on his listeners. He made great use of photographs, which he took with infinite patience. He effectively told his story in a publication, *The Inlander*. A triumph of publicity later was the documentary film "The Inlanders" prepared by the Australian Inland Mission, and sold to commercial film distributors at very little loss, and very widely shown here and in England.

In an early report he answered doubters who thought the money should first be in hand. "Tempted as we always are to walk by sight, not by faith, there is danger that we conclude that in the present circumstances it would be unwise to press too earnestly on our people the claims . . . but the foolishness of God is wiser than men, and the weakness of God stronger than men." His enterprises never lacked the necessary financial support.

So Australian Inland Mission nursing hospitals became an establishment in the inland—"the greatest thing in the inland". Patients, however, still died by the wayside and the service that devoted Australian Inland Mission sisters could provide was not enough in cases of grave emergencies requiring medical aid or surgical aid.

The problem John Flynn saw would be solved by telescoping space into time. The aeroplane was yet in its infancy, but he conceived the idea of an aerial medical service—Flying Doctors—encouraged and helped by Mr. H. V. McKay, of Sunshine, Victoria.

John Flynn realized now that he was trespassing in the territory of experts. He applied, in his own instance, the excellent advice he had given "first-aiders". As he moved about he carefully sounded out medical men and made valued medical contacts throughout Australia. In Melbourne the late Dr. J. W. Dunbar Hooper became intensely interested and his wise counsel and support was a very important factor. Sir John Newman Morris was another whose sustained interest and help has meant much. In Sydney Dr. George Bell and Dr. R. F. Back, in Brisbane Dr. S. F. McDonald and Dr. J. G. Wagner, in Adelaide Sir Henry Newland and in Perth Dr. J. J. Holland were among those many medical men who became interested and devoted much time to discussions with John Flynn.

These leaders of the profession and many others guided John Flynn in every step he took in establishing the experimental Flying Doctor base at Cloncurry and the wider national scheme which later took over.

John Flynn sought the opinion of experts and took it. He studied the subject, not to set himself up as an amateur expert, but so that he could appreciate the language of experts, discuss the matter intelligently and weigh the varying opinion experts always give. He studied wireless and aviation and so, with top experts in every field his friends and advisers, he was able to bring the combination of aviation, medicine and radio to the aid of the inland. He made the dumb inland speak by pedal radio.

He had a sound appreciation of medical etiquette and before plans were completed arranged for a medical man to visit the inland and make contact with medical men in the inland and surroundings, to obtain their views and explain what was proposed. John Flynn was most concerned that there should be harmony and no harmful overlapping of services.

He appreciated the danger of meddling with existing services, unless something better could result. "We must do less or more."

He was very happy when, after the service had been in operation for some two years, a representative conference at Cloncurry "noted with satisfaction that the work was carried out in complete harmony with all existing medical services".

"So, in May, 1928, the first Flying Doctor, K. St. Vincent Welch, arrived in Cloncurry to meet Pilot Affleck waiting for him there with the aerial ambulance *Victory*. That week the Flying Doctor was in the air, a new world personality, writing a new chapter in medical history. The shadow of the *Victory* far below was a little flying cross of salvation across the great wide space of Australia." Early cases were a miracle. "Like a dream come true", as one outback woman told the Flying Doctor when he came the first time to her lonely home, in response to a pedal wireless message.

Soon the service was accepted as an essential institution, and its operation brought much credit to the Australian Inland Mission and the Presbyterian Church.

John Flynn realized that the extension to other areas was not a function of the Church—that a national organization should be created to do this. He had some trouble in

getting permission from the General Assembly to create the new organization, in persuading the Premier's Conference to give a general backing to the proposal and in getting active foundation members. All this was John Flynn's greatest task and its achievement was his greatest success. He was much helped by his friends in the medical profession. The inaugural luncheon in October, 1933, was held in Melbourne and presided over by the Lord Mayor, who, fortunately, was a medical man, Sir Harold Gengoult Smith. The first section of the National Organization was formed in Victoria in 1934, and the British Medical Association and medical friends gave much help in framing the constitution.

Dr. Allan Vickers, who had been Flying Doctor for some years at Cloncurry, was for a time organizer.

The development of sections in other States was rapid, and soon the whole of the outback was enjoying the mantle of safety provided by the Flying Doctor Service.

John Flynn was no longer the guiding hand, for each section had its own committee, but he was an Associate Counsellor in all sections and frequently present at committee meetings. He always remained the inspiration and the central figure.

It was a great regret to John Flynn that one point of his scheme was never implemented—the "British Commonwealth Flying Doctor Service". When, as Dr. Allan Vickers put it, "Australian flying doctors journeying to Great Britain on a scholarship after two or three years' service in our back country will meet there members of the Canadian and South African, Indian or Pakistan Flying Doctor Service, when even these various services, though independently controlled, may be co-ordinated as the 'British Commonwealth Flying Doctor Service' with all the prestige which that great name would confer". Perhaps something of that sort may come as a permanent memorial to John Flynn's great work.

John Flynn was to retire as Superintendent of the Australian Inland Mission in September, 1951. In March he commenced leave prior to retirement, and on March 11 he conducted an induction service in Brisbane and delivered an address which the crowded congregation acclaimed one of the most inspiring in his ministry. It seemed that in his retirement he would have the busiest time of his life, but that was not to be. He returned to Sydney deeply jaundiced. At first it was thought he would soon recover, but the jaundice persisted and liver failure became evident. He was admitted to the Royal Prince Alfred Hospital, where he was content to receive devoted nursing care which he had been the means of providing for so many. He had no symptom but lethargy, and passed into a coma from which he died quietly on May 5.

At his wish his ashes were returned to the inland and committed to the earth at the foot of Mount Gillen, Alice Springs, on May 23. The Commonwealth Government, as a fitting tribute, provided a plane to convey the ashes, and a party representing the Australian Inland Mission and Flying Doctor Service, to the inland. The impressive service at Alice Springs was broadcast over the Flying Doctor pedal wireless system. While a Flying Doctor plane, its shadow showing as a cross on the red rock wall of Mount Gillen, dropped a wreath, silence was observed throughout the whole of the flying doctor network, now covering all inland Australia.

Post-Graduate Work.

THE MELBOURNE PERMANENT POST-GRADUATE COMMITTEE.

PROGRAMME FOR AUGUST.

THE Melbourne Permanent Post-Graduate Committee announces the following programme for August, 1951.

Gynæcology and Obstetrics Refresher Course at the Women's Hospital, Carlton, August 13 to 24.—This course will consist of daily ward rounds conducted in groups, where the routine work of the hospital will be demonstrated and taught, and of a series of demonstrations. Residence at the hospital during the period is advised and will be available. A detailed programme is available from the Post-Graduate Committee. It will be necessary for those attending the course to demonstrate a throat swab "negative" to hæmolytic organisms.

The fee for tuition, £10 10s., is payable to the Melbourne Permanent Post-Graduate Committee; the fee for residence, £3 10s. per week, is payable to the hospital.

Bacteriology for Candidates for Part II D.O., D.L.O. and D.G.O.—It is hoped that there will be sufficient candidates to commence a class on Thursdays at 4.30 p.m. in July, and if so this class will be continued in August.

Week-End Refresher Course at Mildura.—On August 25 to 26 a week-end course will be held at the Mildura Base Hospital:

Saturday: 2.30 p.m., Dr. K. J. Grice, "Coronary Vascular Disease". 4 p.m., Mr. H. Mortensen, "Urological Problems".

Sunday: 9 a.m., Professor Lance Townsend, "Menorrhagia". 10.30 a.m., Dr. Vernon Collins, "The Feeding of Children".

The fee for this course is £2 2s., or 10s. 6d. per demonstration, and enrolments should be made with Dr. T. L. Barker, Red Cliffs.

Lecture at Koroit.—At 8 p.m. on August 18 a lecture will be given by Dr. John Horan on "Epigastric and Substernal Pain". The fee for this lecture is 10s. 6d., and enrolments should be made with the Secretary of the South-West Subdivision of the Victorian Branch of the British Medical Association, Dr. W. R. Angus, Koroit Street, Warrnambool.

Lecture at Flinders Naval Depot.—At 2.30 p.m. on August 8 at Flinders Naval Depot Dr. Norman James will conduct a demonstration on "The Modern Treatment of Asphyxia" by arrangement with the Royal Australian Navy.

Overseas Lecturers.

Mr. Naunton Morgan, F.R.C.S., senior surgeon at Saint Bartholomew's and Saint Mark's Hospitals, London, will lecture in Melbourne at the Royal Australasian College of Surgeons at 8.15 p.m.:

Tuesday, August 7: "The Treatment of Minor Rectal Diseases."

Thursday, August 9: "The Surgical Anatomy of the Ano-Rectal Region and Pelvic Floor."

Monday, August 13: "Cancer of the Rectum."

Friday, August 17: "Cancer of the Colon."

A fee of 10s. 6d. for each lecture is payable in advance to the Melbourne Permanent Post-Graduate Committee, by whom the Victorian arrangements for Mr. Morgan's visit have been made.

On Tuesday, August 14, he will conduct a clinical demonstration at the Royal Melbourne Hospital. This will form part of the hospital's Old Students' Association monthly meeting, but all members of the medical profession are invited to attend. The meeting commences at 8 p.m.

The University of Melbourne, the Melbourne Permanent Post-Graduate Committee and the Victorian Branch of the Australian Dental Association have cooperated to arrange for lectures by Sir Edward and Lady Mellanby, who are visiting Australia at the invitation of the Australian National University. The lectures will be given at the Public Lecture Theatre, University of Melbourne, at 8.15 p.m.:

Wednesday, August 29: "The Future of Medical Science", by Sir Edward Mellanby.

Monday, September 3: "Nutrition and Dental Disease: A Review of Research (1917-1951)", by Lady Mellanby.

Wednesday, September 5: "Medical Research and the State", by Sir Edward Mellanby.

INSTRUCTION IN PUBLIC HEALTH AT LONDON.

THE Royal Institute of Public Health and Hygiene announces that the next bi-annual course of instruction for the certificate in public health, and for the diploma in industrial health (Part I), will commence on Friday, October 5, 1951.

This leads to courses for the diploma in public health and to the diploma in industrial health (Part II), respectively. (All courses may be taken either whole time or part time.) Prospectuses, enrolment forms, and full details may be obtained from the Secretary of The Royal Institute of Public Health and Hygiene, 28 Portland Place, London, W.1, England.

THE UNIVERSITY OF QUEENSLAND POST-GRADUATE MEDICAL EDUCATION COMMITTEE.

A FULL-TIME REFRESHER COURSE in obstetrics and gynæcology will be held at the Brisbane Women's Hospital from Monday, July 16, to Sunday, July 22, inclusive. The mornings will be wholly devoted to clinical work, except that, on Monday, July 16, there will be a demonstration on modern obstetrical equipment. The visiting lecturer for the final week-end will be Dr. T. Dixon Hughes.

The programme for the afternoons and evenings will be as follows:

Monday, July 16: 2.30 p.m., "Exchange Transfusion", Dr. J. C. A. Dique. 4 p.m., "Gynæcological Histopathology", Dr. L. Sapsford. 8.15 p.m., "Mid-Pelvic Dystocia" (with films), Professor Shedden Adam.

Tuesday, July 17: 2.30 p.m., "The Nursing of Premature and Frail Babies", Miss McCorkindale. 4 p.m., "Infections of the Newborn", Dr. Felix Arden. 8.15 p.m.,[1] "Medical Aspects of Obstetrics" (wire recording), with introduction by Dr. L. D. Walters, Professor D. M. Dunlop.

Wednesday, July 18: 2.30 p.m., "Practical Points in Gynæcology" (wire recording), Sir William Gilliatt. 4 p.m., "Renal Physiology in Relation to Obstetrics", Dr. L. D. Walters. 8.15 p.m., "The Lower-Segment Cæsarean Section" (with film), Dr. R. Charlton.

Thursday, July 19: 2.30 p.m., ward rounds (Brisbane General Hospital) (selected gynæcological cases), Dr. R. Charlton. 4 p.m., lecturette (obstetrical subject), Dr. J. Dunkley. 8.15 p.m., "Some Aspects of Medical Gynæcology", Professor Shedden Adam.

Friday, July 20: 2.30 p.m., "High-Dosage Œstrogen Therapy in Pregnancy", Dr. R. Thatcher. 4 p.m., lecturette, "Vaginal Discharges", Dr. C. Marks. 8.15 p.m., "Breech Delivery" (with films), Dr. L. W. Gall.

Saturday, July 21: 8.15 p.m., panel discussion, "Recent Trends in Obstetrics and Gynæcology". Panel—Dr. T. Dixon Hughes (obstetrics), Professor Shedden Adam (obstetrics), Dr. H. McLelland (gynæcology), Dr. R. B. Charlton (gynæcology).

Sunday, July 22: In the forenoon, lecturette, "The Prevention of Eclampsia", Dr. T. Dixon Hughes; clinical demonstration, Dr. T. Dixon Hughes.

The fee for the course is £5 5s., or £2 2s. for the final week-end. Any doctor wishing to attend for an afternoon or evening on any one day may do so on payment of a fee of 10s. 6d. Doctors wishing to enrol for the course, or part of the course, are asked to forward their application with the appropriate fee to the Director, Post-Graduate Studies, 225 Wickham Terrace, Brisbane, before Wednesday, July 11.

Naval, Military and Air Force.

APPOINTMENTS.

THE undermentioned appointments, changes *et cetera* have been promulgated in the *Commonwealth of Australia Gazette*, Number 42, of June 21, 1951.

NAVAL FORCES OF THE COMMONWEALTH.

Permanent Naval Forces of the Commonwealth (Sea-Going Forces).

Appointments.—John Michael Spenser St. John and Gerald Vincent Mulholland are appointed Surgeon Lieutenants (for short service), dated 1st March, 1951, and 1st May, 1951, respectively.

Emergency List.

Transfer to Retired List.—Surgeon Lieutenant Arthur Neville St. George Burkitt is transferred to the Retired List, dated 25th March, 1951.

[1] The programme for the evening of Tuesday, July 17, is contingent upon permission being obtained from the Federal Executive (The Royal Australasian College of Physicians) for this wire recording to be replayed.

Citizen Naval Forces of the Commonwealth.

Royal Australian Naval Reserve.

Appointment. — Richard Kernan Newing (Surgeon Lieutenant, Royal Australian Naval Volunteer Reserve) is appointed Surgeon Lieutenant, with seniority in rank of 18th April, 1946, dated 27th March, 1951.

District Naval Medical Officer.—The resignation of Surgeon Lieutenant-Commander Archibald McLaren Millar as District Naval Medical Officer, Hobart, is accepted, dated 31st December, 1950.

Royal Australian Naval Volunteer Reserve.

Appointments.—Rex Vivian Blaubaum is appointed Acting Surgeon Lieutenant-Commander, with seniority in rank of 18th August, 1948, dated 23rd August, 1950 (seniority as Surgeon Lieutenant 25th May, 1945). Aretas William Overton Young is appointed Surgeon Lieutenant, with seniority in rank of 21st December, 1947, dated 27th September, 1950. Arthur George Harrold is appointed Surgeon Lieutenant, with seniority in rank of 29th November, 1947, dated 21st October, 1950.

District Naval Medical Officer.—Surgeon Lieutenant Aretas William Overton Young is appointed District Naval Medical Officer, Hobart, dated 1st January, 1951.

AUSTRALIAN MILITARY FORCES.

Royal Australian Army Medical Corps.

NX700261 Honorary Captain N. C. Davis is appointed from the Reserve of Officers, and to be Captain and Temporary Major, 2nd March, 1951.

The following officers are appointed from the Reserve of Officers, and to be Captains, 13th February, 1951: Honorary Captains SX700053 R. Barnes and SX700054 W. I. Seith (in lieu of the notification respecting these officers which appeared in Executive Minute No. 59 of 1951, promulgated in *Commonwealth Gazette* No. 26 of 1951).

VX700108 Captain B. H. Gandevia is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (3rd Military District), 13th April, 1951.

VFX700110 Captain D. V. Gandevia (*née* Murphy) is placed upon the Retired List (3rd Military District) with permission to retain her rank and wear the prescribed uniform, 12th April, 1951.

To be Captain, 9th March, 1951.—NX700262 Leslie Leonard Nordstrom.

Citizen Military Forces.

Northern Command: First Military District.

Royal Australian Army Medical Corps (Medical): To be Captain (Provisionally), 12th April, 1951.—1/46775 John Lee Jameson.

Southern Command: Third Military District.

Royal Australian Army Medical Corps (Medical).—3/82441 Captain D. C. Cowling is appointed from the Reserve of Officers, 8th March, 1951. 3/107675 Captain F. A. L. Bacon is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (3rd Military District), 5th February, 1951. The provisional appointment of 3/101008 Captain I. S. Epstein is terminated, 8th December, 1950. To be captain (provisionally), 6th April, 1951: 3/101813 William Hicks Coates.

Central Command: Fourth Military District.

Royal Australian Army Medical Corps (Medical).—4/31908 Captain J. S. Skipper is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (4th Military District), 7th February, 1951. The provisional appointment of 4/35229 Captain D. A. Simpson is terminated, 3rd February, 1951.

Western Command: Fifth Military District.

Royal Australian Army Medical Corps (Medical).—5/26401 Captain L. G. B. Cumpston is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (5th Military District), 14th March, 1951.

Reserve Citizen Military Forces.

Royal Australian Army Medical Corps.

1st Military District.—To be Honorary Major, 20th March, 1951: Captain F. W. R. Lukin. To be Honorary Captains: Allan George Perina, 6th April, 1951, and Gavin James Douglas, John Joseph Power, Lawrence John Lowth, James

Kevin O'Reilly, Ian Duncan Forbes and Eugene George Galea, 12th April, 1951.

2nd Military District.—The resignations of the following officers of their commissions are accepted: Captains C. Y. Symons, 1st March, 1951, and K. R. Barder, 13th March, 1951.

3rd Military District.—To be Honorary Captain, 8th December, 1950: Ivan Samuel Epstein.

4th Military District.—To be Honorary Captain, 3rd February, 1951: Donald Allen Simpson.

5th Military District.—To be Honorary Captain, 6th April, 1951: Kevin John Cullen.

6th Military District.—Major G. R. Beattie is placed upon the Retired List (6th Military District) with permission to retain his rank and wear the prescribed uniform, 30th March, 1951.

ROYAL AUSTRALIAN AIR FORCE.

Permanent Air Force: Medical Branch.

Group Captain R. B. Davis (033026) is granted the Air Efficiency Award.

Air Force Reserve: Medical Branch.

The following former officers are appointed to commissions with the rank of Flight Lieutenant: J. H. A. Floyd (033055), 19th October, 1950, G. P. Cromie (257501), 31st January, 1951.

Australian Medical Board Proceedings.

NEW SOUTH WALES.

THE undermentioned have been registered, pursuant to the provisions of the *Medical Practitioners Act*, 1938-1945, as duly qualified medical practitioners:

May, Alexander Joseph, M.B., B.S., 1924 (Univ. Melbourne), M.R.C.P. (London), 1929, M.R.A.C.P., 1938, Alexandra Crescent, Bayview.

Methuen, David Titterington, M.B., B.S., 1936 (Univ. London), c.o. Dr. K. J. Eager, Corowa.

Webb, Brian Hayley, M.B., B.S., 1949 (Univ. Durham), H.M.A.S. *Rushcutter*, Sydney.

Young, William Hall, M.B., Ch.B., 1932 (Univ. Sheffield), Wiseman's Ferry.

The following additional qualification has been registered:

Bennett, Victor Jack, Repatriation General Hospital, Concord (M.B., B.S., 1943, Univ. Sydney), M.R.A.C.P., 1950.

QUEENSLAND.

THE undermentioned have been registered, pursuant to the provisions of *The Medical Acts*, 1939-1948, of Queensland, as duly qualified medical practitioners:

Atherton, Richard Aubrey, L.R.C.P. (Edinburgh), 1948, L.R.C.S. (Edinburgh), 1948, L.R.F.P.S. (Glasgow), 1948, 244 Vulture Street, South Brisbane.

Hutton, Jessie Florence Ada, M.B., B.S., 1942 (Univ. Punjab), c.o. P. W. Mitchell, Esq., Moola Road, Ashgrove, Brisbane.

Elliott, Murray William, M.B., B.S., 1943 (Univ. Adelaide), D.O., R.C.O.G., 1950, M.R.C.O.G., 1950, Brisbane Clinic, Wickham Terrace, Brisbane.

Mathieson, John Bryan, M.B., B.S., 1937 (Univ. Sydney), D.T.M., 1942 (Univ. Sydney), Commonwealth Department of Health, Adelaide Street, Brisbane.

Playne, John Herbert, L.M.S.S.A., 1934, M.B., B.S., 1936 (Univ. London), Mount Isa Mines, Limited, Mount Isa.

Reynolds, Farrell John, M.B., B.S., 1948 (Univ. Sydney), Flying Doctor Base, Charleville.

Wonders, Ivor Herbert Richard, M.B., B.S., 1948 (Univ. Sydney), 129 Russell Street, Toowoomba.

Willson, Mary, L.R.C.P., L.R.C.S., L.M. (Ireland), 1942, Hospitals Board, Hughenden.

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED JUNE 16, 1951.[1]

Disease.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Northern Territory.[2]	Australian Capital Territory.	Australia.[3]
Ankylostomiasis	*	..	..	..	..	..	..	..	..
Anthrax	*	..	..	..	..	..	..	..	..
Beriberi	*	*	*	*	*	*	..	*	..
Bilharziasis	*	..	..	..	..	..	..	..	..
Cerebro-spinal Meningitis	4(4)	2(2)	1(1)	.	..	1	..	..	8
Cholera	..	..	..	..	..	..	..	..	..
Coastal Fever(*a*)	*	*	..	*	*	*	*	*	..
Dengue	*	*	*	*	*	*	..	*	..
Diarrhœa (Infantile)	..	..	1(1)	..	..	2(1)	..	..	3
Diphtheria	12(6)	7(3)	..	..	3(3)	..	..	..	22
Dysentery (Amœbic)	*	..	..	..	..	..	..	..	..
Dysentery (Bacillary)	*	2(1)	1	2(2)	1(1)	..	..	2	8
Encephalitis Lethargica	..	..	..	..	..	..	..	..	..
Erysipelas	*	*	*	..	*	*	..	..	..
Filariasis	*	..	..	..	..	..	..	..	..
Helminthiasis	*	..	*	*	*	*	*	*	..
Hydatid	*	..	*	*	..	*	*	..	..
Influenza	*	*	*	..	*	*	..	*	..
Lead Poisoning	*	*	..	*	*	*	*	*	..
Leprosy	..	..	..	..	..	..	..	..	..
Malaria(*b*)	*	..	..	..	..	..	..	..	..
Measles	*	*	*	27(2)	*	*	..	..	27
Plague	..	..	..	..	..	..	..	..	..
Poliomyelitis	20(12)	7(3)	20(8)	19(14)	2(2)	1	..	1	70
Psittacosis	*	..	*	..	*	*	*	*	..
Puerperal Fever	..	..	1(1)	..	..	..	..	..	1
Rubella(*c*)	*	*	..	*	4	*	..	..	4
Scarlet Fever	18(10)	28(18)	4(1)	7(3)	4(2)	3	..	..	64
Smallpox	..	..	..	..	..	..	..	..	..
Tetanus	*	..	1	*	*	*	*	*	1
Trachoma	*	..	*	*	*	*	*	*	..
Tuberculosis(*d*)	16(12)	19(11)	14(11)	7(6)	15(12)	4(1)	..	..	75
Typhoid Fever(*e*)	..	..	..	..	..	..	..	..	..
Typhus (Endemic)(*f*)	1	..	2	..	2(2)	..	..	..	5
Undulant Fever	..	..	..	..	1(1)	..	..	..	1
Weil's Disease(*g*)	*	*	..	..	*	*	*	*	..
Whooping Cough	*	*	*	2	*	*	..	..	2
Yellow Fever	..	..	..	..	..	..	..	..	..

[1] The form of this table is taken from the *Official Year Book of the Commonwealth of Australia*, Number 37, 1946–1947. Figures in parentheses are those for the metropolitan area.
[2] Figures not available.
[3] Figures incomplete owing to absence of returns from the Northern Territory.
* Not notifiable.
(*a*) Includes Mossman and Sarina fevers. (*b*) Mainly relapses among servicemen infected overseas. (*c*) Notifiable disease in Queensland in females aged over fourteen years. (*d*) Includes all forms. (*e*) Includes enteric fever, paratyphoid fevers and other Salmonella infections. (*f*) Includes scrub, murine and tick typhus (*g*) Includes leptospiroses, Weil's and para-Weil's disease.

Willson, Leslie, M.B., Ch.B., 1942 (Univ. Edinburgh), Hospitals Board, Hughenden.
Miles, Derek Frazer, M.B., B.S., 1950 (Univ. Sydney), Repatriation General Hospital, Greenslopes, Brisbane.
Kent, Pauline Ashenden, M.B., B.S., 1944 (Univ. Sydney), Millmerran.
Horsfall, William Russell, M.R.C.S. (England), L.R.C.P. (London), 1944, M.B., B.Ch., 1944 (Univ. Cambridge), Commonwealth Health Laboratory, Cairns.
Adlam, Julius Patrick, M.B., B.S., 1941 (Univ. London), L.R.C.P. (London), M.R.C.S. (England), 1941, Emerald.
Elyan, Michael, L.M., L.R.C.P. (Ireland), L.R.C.S (Ireland), 1921, D.C.H. (London), 1949, Townsville Hospital, Townsville.

The following additional qualifications have been registered:

Anderson, Graham Roland, F.R.C.S. (England), 1950, Brisbane General Hospital, Brisbane.
Hickey, Glen Vincent, F.R.A.C.S., 1951, 132 Margaret Street, Toowoomba.
Tange, John Damien, M.R.A.C.P., 1951, 21 Valentine Street, Toowong, Brisbane.

TASMANIA.

THE undermentioned have been registered, pursuant to the provisions of the *Medical Act*, 1918, of Tasmania, as duly qualified medical practitioners:

Nally, Patrick James Francis, L., L.M., 1943, R.C.P. (Ireland), L., L.M., 1943, R.C.S. (Ireland), Ouse, Tasmania.
McIntyre, Donald McDonald, M.B., Ch.B., 1915 (Univ. Glasgow), Longford, Tasmania.
Calvert-Smith, Daphne Violet, M.R.C.S. (England), L.R.C.P. (London), 1945, M.B., B.S., 1946 (Univ. London), Longford, Tasmania.
MacDonald, William Bowie, M.B., B.S., 1942 (Univ. Melbourne), Victoria Street, Hobart.
Healy, John Rambaud, M.B., B.Ch., 1941 (Univ. Dublin), Macquarie Street, Hobart.

Congresses.

SECOND EUROPEAN CONGRESS OF RHEUMATOLOGY.

THE second European Congress of Rheumatology will be held in Barcelona from September 24 to 27, 1951. It is requested that applications for enrolment be sent to the general secretary's office as soon as possible. The enrolment fee may be paid in Barcelona. The date for admission of papers to be presented by members of the congress has been extended to July 30, 1951. Only one paper per author may be read, but members may present as many as they wish in order to have them published in the proceedings of the congress. Those wishing to present books or monographs on rheumatological subjects, to be displayed in the bibliographical exhibition, are asked to advise the general secretary as soon as possible. The general secretary is Dr. Pedro Barceló, Vía Layetana, 31 (Casa del Médico), Barcelona.

The Royal Australasian College of Physicians.

EXAMINATION FOR MEMBERSHIP.

INTENDING CANDIDATES for the examination for membership of The Royal Australasian College of Physicians to be held in September-October, 1951, are reminded that applications for this examination close on Saturday, August 4, 1951. Application forms may be obtained from the Honorary Secretary, 145 Macquarie Street, Sydney. The written examination will take place in capital cities where candidates are offering on Saturday, September 1, 1951, and the clinical examination will be held in Melbourne approximately from October 11 to 13, 1951.

Nominations and Elections.

THE undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

Conley, Valda Mary, M.B., B.S., 1951 (Univ. Sydney), Tweed District Hospital, Murwillumbah.
Cook, James Cecil Murray, M.B., B.S., 1950 (Univ. Sydney), 23 Killarney Street, Mosman.
Gale, Barry Mitchell, M.B., B.S., 1951 (Univ. Sydney), Auburn District Hospital, Auburn.
Roche, John Vincent, M.B., B.S., 1951 (Univ. Sydney), Saint Vincent's Hospital, Darlinghurst.
Crane, Henry Graham Elliott, M.B., B.S., 1951 (Univ. Sydney), 20 Nicholson Street, Burwood.

Diary for the Month.

JULY 17.—New South Wales Branch, B.M.A.: Medical Politics Committee.
JULY 18.—Western Australian Branch, B.M.A.: General Meeting.
JULY 19.—New South Wales Branch, B.M.A.: Clinical Meeting.
JULY 19.—Victorian Branch, B.M.A.: Executive Meeting.
JULY 24.—New South Wales Branch, B.M.A.: Ethics Committee.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Medical Secretary, 135 Macquarie Street, Sydney): All contract practice appointments in New South Wales.

Victorian Branch (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federal Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

Queensland Branch (Honorary Secretary, B.M.A. House, 225 Wickham Terrace, Brisbane, B17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 178 North Terrace, Adelaide): All Lodge appointments in South Australia; all Contract Practice appointments in South Australia.

Western Australian Branch (Honorary Secretary, 205 Saint George's Terrace, Perth): Norseman Hospital; all Contract Practice appointments in Western Australia. All government appointments with the exception of those of the Department of Public Health.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to the Editor, THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2.)

Members and subscribers are requested to notify the Manager, THE MEDICAL JOURNAL OF AUSTRALIA, Seamer Street, Glebe, New South Wales, without delay, of any irregularity in the delivery of this journal. The management cannot accept any responsibility or recognize any claim arising out of non-receipt of journals unless such notification is received within one month.

SUBSCRIPTION RATES.—Medical students and others not receiving THE MEDICAL JOURNAL OF AUSTRALIA in virtue of membership of the Branches of the British Medical Association in the Commonwealth can become subscribers to the journal by applying to the Manager or through the usual agents and booksellers. Subscriptions can commence at the beginning of any quarter and are renewable on December 31. The rate is £4 *per annum* within Australia and the British Commonwealth of Nations, and £5 *per annum* within America and foreign countries, payable in advance.